CONCRETE BARGES. *See p.* 294.
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SHIPBUILDING AND SHIPPING RECORD

A JOURNAL OF SHIPBUILDING, MARINE ENGINEERING, DOCKS, HARBOURS AND SHIPPING

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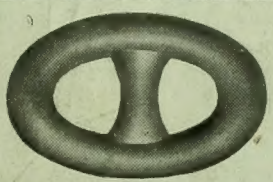

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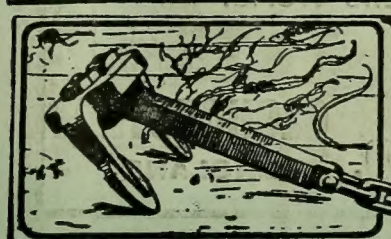

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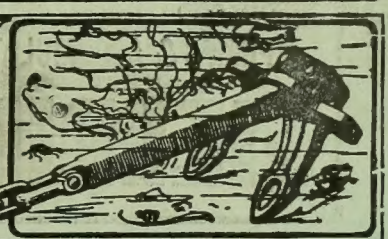

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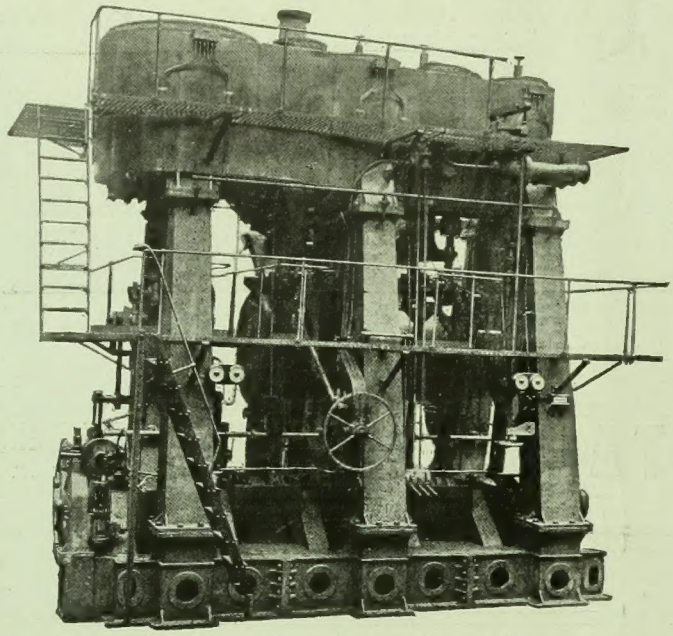

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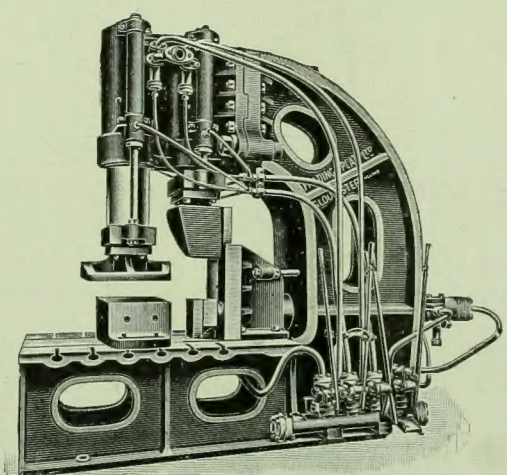

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THERE are two distinct methods of meeting the submarine menace, the first of which consists of hunting and destroying these undersea pests, the second, of constructing new tonnage with the utmost rapidity in order to replace that which is sunk. Mr. Lloyd George in his recent speech indicated how successful were the measures being taken in the second direction, but it is apparent that the first method is by far the more satisfactory, and for that reason the country welcomed the particulars recently published by the press in which accounts were given of the actual combats which occurred between our auxiliary naval forces or our armed merchant ships and the enemy submarines, and in which the U-boat had the worst of the fight. An analysis of the narrative as published shows that nine fights were described in which five submarines were positively sunk and in the other four cases, although the result is not certain, the submarines were badly damaged if not actually destroyed. In four cases defensively armed merchant vessels successfully fought the pirates; in three it was auxiliary naval vessels which were engaged, in one a British seaplane had the better of the fight with an enemy submarine, and in the last, one of our own undersea craft met and destroyed one of the enemies. Apart from their intrinsic interest these reports have a heartening effect upon public opinion as indicative of the success that is attending our efforts in the offensive phase of the submarine war; and now that the silence has been once broken, we think that the Admiralty might publish, say once a month, the number of engagements with the U-boats, giving the figures—as is done with enemy aircraft—as so many vessels actually destroyed and so many probably destroyed. Such figures would convey no information to the enemy, except that if they reached the German people, it would convince them of the futility of the hopes they have reposed in the success of the submarine blockade.

Hunting the Submarines.

The report of the Prince Line for the year ended June 30 indicates no falling off in the new level of prosperity established by the undertaking in recent years. Since Furness Withy & Co., Ltd., acquired control of the company by share purchase the net profits have been struck after allowing for depreciation, and the amount of the latter has not been disclosed, so that in making a comparison between the net profits of the past few years and previous years this must be borne in mind. The comparative figures are as follows:—

Prince Line Report.

Year.	Net profit.	To depreciation.	Reserves.	Carried forward.
	£	£	£	£
1907	31,700	62,500	Nil	3,400
1908	29,500	47,500	Nil	2,790
1909	16,739	47,500	Nil	1,486
1910	16,040	47,500	Nil	2,488
1911	58,195	65,000	10,000	5,571
1912	112,962	100,000	50,000	8,334
1913	250,827	175,000	150,000	18,987
1914	115,400	165,000	75,000	28,800
1915	341,100	Not disclosed	190,000	35,600
1916	495,300		300,000	50,500
1917	430,817		250,000	50,829

If depreciation has been in or about the same proportion in the last few years as in the earlier years, it may be assumed, after remembering that excess profits duty and income tax are allowed for, that the full profits have not been far short of a £1,000,000 per annum. It is thus evident that the Prince Line is proving a very valuable asset to the Furness Withy Company, despite the big price paid for share control. The final dividend is again 25 per cent., making 30 per cent. for the year. The policy of the Furness Withy Company in setting aside out of profits a large sum for the protection of trades in which the company is interested, is followed in the case of the Prince Line. The fund for this purpose is increased by £250,000 to £700,000, bringing it to the same level as the fund of Furness Withy & Co. It is mentioned in the report that shortly after the last annual meeting all the directors except Lord Furness and Mr. F. W. Lewis resigned and new directors (representing the Furness Withy interests) were appointed in place of them.

Our note of last week's issue on a new aspect of deferred repairs has resulted in our attention being called to another case very similar in its details, but to which a different treatment has been applied. A vessel in need of repairs was required to make a voyage as soon as possible, and the owner decided to execute temporary repairs, rather than wait till permanent work could be done. With a view to protecting himself, he caused the facts to be placed before the Underwriters, at the same time asking them if they were prepared to admit liability for the temporary work, irrespective of whatever might be found necessary in the way of permanent repairs afterwards. As an argument in favour of his request being granted, it was suggested that, in the event of the vessel being lost, underwriters would be less out of pocket than if the permanent work had been done, while in the event of a war loss, the temporary repairs would be all that they would have to pay for. Incidentally, this last statement is open to question, since the liability of underwriters for repairs not effected on a sunk vessel seem to be somewhat obscure. It will be noticed that the case at present under discussion differs from that of last week, in that there is no question of compulsion on the part of the authorities, which was very evident in the other case. Presumably, that makes a great deal of difference, for underwriters appeared to have no doubt as to their liability in the first case, while in the latter case they have declined to acknowledge their liability, though they have intimated that they are willing

Deferred or Permanent Repairs.

to consider the case on its merits when the matter comes up for final adjustment.

A New Insurance Company.

We notice that an application before a learned judge was made the other day, on behalf of a company which, hitherto, had not been interested in marine insurance, and who applied for powers to be granted in order that they might undertake such business. The shareholders in the concern were unanimous in their consent to the step being taken, and a fund of some £10,000 has been provided to form the nucleus of an insurance fund, so, the application having been granted, it is expected that another unit will be added to the already long list of new insurance companies. It is evident that the shareholders are of the opinion that the present is a suitable time to come into the market, and it is true that on the published results, a large sum of money has been made by some of the established companies. To say that a new company starting at the present moment would enjoy the same success as has attended the older concerns is rather a daring statement, however. In the first place, there is a very general opinion that the marine insurance market is perfectly capable of absorbing any amount that it may be asked to take at the present time. Any further additions may have the effect of bringing an undue amount of rate cutting, with its inevitable loss to underwriters. Again, it will be found that the older companies are content to write an amount which brings in premiums somewhere about equal, in amount, to their paid-up capital and their reserves, while an equal restraint on the part of a company with a fund of £10,000 would mean that the size of the account would not be of sufficient dimensions to leave a very large sum in profits, however large the margin of premiums over claims may be.

Shipowners and the Public.

In some more or less influential quarters there seems to be a belief that British shipowners are incapable of satisfactorily organising their industry for the conditions which will prevail after the war. We do not share it. The position is certainly difficult and delicate, and the efforts of an unimportant but noisy section of the public are encouraging the Government to be less sympathetic with shipping than even British Governments as a rule are. But most reasonable men who are in touch with what is happening are fairly confident, we imagine, that our shipowners see exactly where they desire to go and are quite capable of reaching their main objectives. Being inside the business, shipowners naturally know more about it than those who from the outside are inciting them to vigorous action in this direction or that. That, at any rate, ought to be conceded to them. We repeat, however, that it is not overwise of them to neglect public opinion to the extent they do. As we have said, they know almost exactly what it is necessary to do and intend to do it at the right time. They will find their task all the more easy, we submit, if they have with them at the critical moment a well-informed public opinion. Public opinion is almost dead against them at present largely because it is ill-informed. The "facts" available for its guidance are not difficult to deal with. We could deal with them without official assistance; but that kind of action would not suffice. What is needed is the organisation of public opinion by shipowners in the interest of shipping. It is to be hoped that shipowners will sooner rather than later realise that.

Swiss Oversea Trade Routes.

For obvious reasons Swiss oversea trade is exercising the minds of German shipping interests to no small degree. During the war Swiss oversea imports and exports have passed almost entirely through France or Italy, particularly through the French Port of Cette, which has good rail connection with Switzerland. Naturally, France wishes to retain as much Swiss traffic as possible after the war and hopes for good results from a waterway from Switzerland to the sea *via* the Rhone. *Hansa* maintains that Northern routes are shorter and cheaper, and says:—"The recent decision to build a large Rhine harbour in Basle shows that Swiss opinion is in favour of developing the northern, Rhine route. Further, a Dutch-Swiss trading company was recently founded, one of its primary aims being to facilitate renewal of Swiss trade with Rotterdam and Amsterdam after the war. Also the "Suisse-Belgique Outremer," founded in Lausanne, aims at developing a Swiss overseas traffic route through Belgium." Neither of these companies can make much headway so long as the present conditions exist and it is safe to say that, in any case, German influence on, and interest in, Swiss trade routes will be very different after the war from what the enemy is pleased to consider them at present.

Imperial Shipping Law.

Before the war a movement promoted for the most part by commercial lawyers and thoughtful merchants in overseas trade was making some progress with ideas for the unification of mercantile and maritime law. One or two steps of a practical nature were taken in reference to navigation, but the war has put a stop to further progress. Undoubtedly simplification and unification of laws smooth the course of international trade. Even substantial benefits would accrue from the application of these principles within the British Empire. It was no doubt the realisation of this fact that induced the Joint Committee of the Chamber of Shipping and the Liverpool Steam Ship Owners' Association to emphasise the desirability of having shipping throughout the Empire under uniform Imperial laws. This point does not seem to have sufficiently impressed itself upon the Dominions Royal Commission, for they merely recommended an unpracticable application of the principles of the Harter Act to this country. Of course in shipping matters some of the Dominions seem inclined to go their own way, but it appears to us that they would consult their own ultimate commercial advantage if they were content to sink their own particular ideas in letting their legislation coincide with Imperial legislation.

Speed of Clipper Ships.

The remarkable performances of some of the famous clipper ships of fifty years ago are still a matter of interest even in these days of steam. It is on record that the *Fiery Cross*, one of the five sailing ships which took part in the greatest ocean race in history, from Foochow-foo to London, made the splendid speed of 13·7 knots for a space of 24 hours, traversing 328 knots in that time. Three ships of the five made the voyage round the Cape to London in 99 days, which performance was afterwards eclipsed by probably the fastest clipper that was ever built, namely the *Thermopylæ*, which accomplished the same journey in 91 days. The quickest sailing passage on record to Australia was also made by that ship. On her maiden voyage from London to Melbourne she made the passage in 60 days, a performance which bears testimony to the admirable design of these five ships. The *Thermopylæ* was a typical Aberdeen clipper, being built by Walter Hood & Co. of that city. The firm of Steel & Son, of Greenock, also built a large number of fine sailing ships, whose performances at sea was a matter of general interest in those far-off days, and aroused the enthusiasm of the public as much as the attempts at the Atlantic record did a few years ago.

Semi-skilled Workers' Wages.

Mr. Barnes, M.P., is of the opinion that if the Ministry of Munitions had made collective piecework instead of individual piecework compulsory in all national and controlled establishments, a "great deal of trouble" might have been saved. "Individual piecework, together with the provisions agreed to at the Treasury Conference in April, 1915, has led," he says, "to the anomaly of partially skilled workers earning more money than the skilled workers who supervise them." Whether collective piecework is as good from

every point of view as it seems to be from some, remains to be seen. Before being sure about it we should like to see the details of the system as it is worked at Barnsley and elsewhere. We are, however, less concerned at the moment about the merits or demerits of collective piecework than we are about the causes of the trouble for which Mr. Barnes prescribes collective piecework as a remedy. If we mistake not, it was the trade unions and not the Ministry of Munitions or the Employers' Federation which brought about "the anomaly of partially skilled workers earning more money than the skilled workers who supervise them." Forgetting that semi-skilled workers, not being members of a skilled workers' union, might feel themselves under no obligation to put arbitrary limits to output, they insisted on the payment to the semi-skilled workers of the skilled workers' piece rates. Being only teachers and supervisors, and not direct producers, the skilled men's wages have a certain relationship to pre-war earnings. The semi-skilled workers' wages are high simply because he has never recognised any limitation of output. It is certainly an anomaly, but the skilled workers are themselves to blame for it.

Famous Racing Yachts.

When the King was at Meadowside last week he had not unnaturally something to say to Mr. Fred Henderson about the famous racing yachts which are to the credit of the firm. The royal cutter *Britannia* was built in the yard; so were the America Cup challengers *Genesta*, *Thistle*, *Valkyrie II* and *Valkyrie III*, the German Emperor's *Meteor II*, the Duke of the Abruzzi's *Bona*, Sir A. Orr-Ewing's *Rainbow*, Mr. Whittaker Wright's *Sybarite*, Mr. James Coats' *Gleniffeo*, Admiral Montague's *Carina*, and Mr. H. Walker's *Caress*. All of these, with the exception of *Genesta* —which was a Beaver Webb yacht—were designed by Mr. G. L. Watson. Indeed, practically the whole of Mr. Watson's maturer work was done by Messrs. Henderson, who have only two other large racing yachts to their credit—Sir Richard Sutton's *Genesta* (already mentioned) and Mr. W. B. Paget's *Namara*. Only *Shamrock II* of the eminent designer's later yachts was built elsewhere; she was constructed at Denny's, Dumbarton. On the opposite side of the Kelvin, at Pointhouse, *Astrild* was built for Mr. P. M. Inglis, for whom the firm also constructed *Nevada* from designs by a young member of the Herreshoff family. Mr. Peter Donaldson's *Calluna* and Mr. Barclay Walker's *Ailsa* were also, of course, built by A. & J. Inglis; so that it would be to make a claim which could not be convincingly disputed off-hand that more famous large racing yachts have been built at the confluence of the Clyde and the Kelvin than in any other area of the same size in the United Kingdom. His Majesty told Mr. Henderson that *Britannia* was still in first-rate condition; that was, if our memory serves, the conclusion which was drawn when she was being fitted out for the service of King George. She is, in fact, fine tribute to the excellence of Meadowside work.

Precedent and Experiment.

It has been said by a well-known Clyde shipbuilder, that anyone who had seen the collections of models in various yards could trace in all the models in each yard a strong family resemblance between the fullest and the finest. The same typical sections had been used, but re-spaced to suit the particular fullness of ship desired. Now this may be a good practice or it may be otherwise. The chances are that it is not good. Investigation has shown that the same type of line is not that which gives the best form of sectional area curve over all possible ranges of prismatic coefficient; therefore, if possible, the form of a vessel whose performances are known to have been good should be taken as the parent for a vessel of approximately the same fullness. It is possible, of course, to obtain a form of any particular fullness by the addition or subtraction of parallel middle body, or by drawing out or contracting the parent form. When it is known that the form thus being used is good there may be little evil in so doing, but it has been shown that little differences in form at various fullnesses make a considerable difference in resistance. If, besides this, the form peculiar to the yard should happen to be resistful, the evil is being carried into all the vessels built in that place. Now when the advantages of experimental tanks are open to all, it would be wise of shipbuilders to have some of their typical vessels tested so that their propensities would be known. If these lines are shown to be bad they should be discarded and those of least resistance perpetuated.

Welding in Shipyards.

Although only of recent development, welding has come to be regarded as one of the simplest and best methods of joining together two pieces of metal, and no up-to-date shipyard can be considered complete without an equipment for carrying out welding operations. It is found that many jobs which were previously done by riveting or bolting are much more rapidly and efficiently performed by one of the many welding processes now upon the market. Mechanical tests which have been made on welded specimens disclose the fact that the weld is often stronger than the material itself, and already we have heard of the two halves of the drums of water-tube boilers being welded together instead of riveted. If the welded joint can be made to withstand the high pressures and high temperatures obtaining in the water-tube boiler, it may safely be said that this method should be well suited for the construction of tanks and those details of ships where riveting presents any peculiar difficulties. Moreover, welding is not only of value in new construction, it is particularly adapted to repair work. It has become recognised as standard practice to repair broken stern frames and propeller blades by welding, and cracked castings are also efficiently repaired by this means. But the great advantages offered by this method of joining together two pieces of metal are not yet fully realised by shipbuilders and marine engineers, and there are many processes now carried out by more cumbersome methods which could be cheaply and efficiently carried out by welding.

A Cause of Hot Bearings.

In an article on the design of oil-ring bearings which appeared recently in a contemporary, the author opines that a frequent cause of hot bearings is the lack of contact between the bearing metal and the outside shell, this lack of contact being produced by the shrinking of the babbit metal when poured in the journal box, due to the difference in the coefficient of expansion and temperature of the babbit metal and the bearing shell—the coefficient of expansion of babbit metal being between two and three times greater than that of cast iron. When secured with buttons to the outer shell, the buttons will prevent the white metal from becoming loose, but for this very reason shrinkage stresses are produced in the white metal, which under shocks and heavy loads develop cracks that will become gradually impregnated with oil. The presence of an oil film at those places where good contact is not obtained between the white metal and the outside shell, owing to the very low heat conductivity of the oil, will prevent the dissipation of the heat from the babbit metal to the shell and from this to the atmosphere, thus increasing the temperature of the babbit metal. The ideal bearing metal would be one which expanded during the process of solidification instead of contracting, and approximating to this ideal are the antimony alloys.

Independent Salvage Pumps.

Although the war has increased the risks of merchant ships a thousandfold by the menace of torpedo and mine, there has always been the possibility of a ship foundering at sea as a result of collision with another vessel or with sunken rocks or icebergs. The most vital part of the ship is the machinery space, and if either the engine-room or the boiler-room become flooded, the whole of the machinery is put out of action, and the ship depends entirely upon outside sources for any chance of making

port. It has long been realised that the chances of assistance are greatly increased by the installation of an emergency dynamo for operating the wireless installation, and the Merchant Shipping Act of 1914 makes it compulsory for ships to carry such a dynamo, "placed in the upper part of the ship in the place of greatest safety." But whilst assistance may or may not be forthcoming, the ship will be gradually sinking, because, save for the small hand pump which is always fitted, the bilge pumps are out of action. If an emergency power-driven pump had been fitted in the same position as the emergency dynamo, the pump having connections to all parts of the vessel, this could be operated so as to discharge water from those compartments which are least damaged, and the prospects of keeping the vessel afloat would be greatly increased. The internal-combustion engine is admirably suited for this purpose; it is compact, can be easily and quickly started, has a high speed of rotation and thus lends itself to the driving of a rotary pump. If the Merchant Shipping Act were amended so as to make the carrying of such a pump compulsory in addition to the carrying of an emergency dynamo, a greater number of damaged vessels would succeed in reaching port.

SHIP RESISTANCE CALCULATIONS.

IT is important to be able to estimate as accurately as possible the horse-powers of new ships, and while it is still true that a certain margin must be allowed for contingencies—which is another way of saying that it is not possible to estimate with great accuracy—the more that possible source of error is eliminated, the smaller need this margin be. In this connection the dictum laid down by Mr. R. E. Froude in his paper read before the Institution of Naval Architects in 1904 does not appear to have received the attention it deserves. In this paper Froude presented a systematic series of model experiments which were carried out for two grades of cross-section proportion. In one set the ratio of beam to draught was about 2·6 and in the other about 3·5, the midship section coefficient being ·877. In the ordinary way this would limit the application of the data, but a method was given whereby it becomes possible to apply the results to other ships with different midship section coefficients. Froude indicated a method whereby the results could be applied to vessels having coefficients of, say, ·97 and ·78. The method of procedure was to assume for any particular vessel with a coefficient different from ·877 that the beam was unaltered, but the draught of the vessel in question was altered in the inverse ratio of the midship section coefficients. Accordingly, the beam to draught ratio to use in arriving at an estimate of the resistance would not be the actual beam to draught ratio but that ratio altered in the inverse ratio of the midship section coefficient.

This principle is particularly useful when applied to Taylor's standard series of resistance curves. The method of doing this was apparently first published in a paper read before the Liverpool Engineering Society on "Some Considerations in the Design of Channel Steamers," by Mr. A. T. Wall, in 1915. The author was dealing with a series of Channel steamers where the midship section coefficient was different from that used by Taylor throughout his standard series, namely, ·926. In estimating the resistance of these vessels their beam to draught ratios were all multiplied by the ratio of ·926 to the actual midship section coefficient of the vessel. The new beam to draught ratio was then used in applying Taylor's series.

Such a procedure might be looked upon as an unnecessary refinement in many cases, and it does not appear to be of very great importance in ordinary slow-moving merchant vessels, although their midship section coefficient will generally be in the neighbourhood of ·98. This arises from the fact that the residuary or wave-making resistance, which is the only part of the resistance affected by the consideration in question, is a small proportion of the total, and consequently an error in it is not a serious matter in the total resistance. On the other hand, when faster vessels are under consideration and the wave-making resistance is a greater proportion of the total the difference is worth considering. The correction is of some moment when very fine-lined fast vessels are being dealt with. In such ships the midship section coefficient might be as small as ·7, and the ratio between this figure and ·926 as used by Taylor will alter the beam to draught ratio quite a large amount.

BRITISH STEEL OUTPUT.

THE production of steel is a subject of the utmost importance to the shipbuilder, and the prosperity of the shipbuilding industry is dependent in no small measure upon the availability of a large supply of good quality steel at cheap rates. Hence the reports of the metallurgical and mechanical sections of the committee of the Iron and Steel Institute dealing with the above subject will be received with much interest at the present time. It had been found that the output of steel from British furnaces was much smaller than that obtained in foreign countries, and the committee having decided that an investigation into the causes of this would be of value, issued a list of questions to various steel producers in the country in the hope of elucidating the matter. A summary of the answers received forms the basis of the reports.

In order to show how great is the disparity between the production of steel in this country and in America or Germany, and at the same time in order to show the difference between the wages paid, the metallurgical section of the committee prepared a comparative table giving earnings per shift and ratio of weight of steel made per shift, which is worthy of reproduction.

Earnings per Shift (Pre-War Figures).

	English.	American.	German.
1st hand	36/11	17/4	9/6
2nd ,, ...	24/9	11/3	7/-
3rd ,, ...	18/5	9/9	5/6
Total	80/1	38/4	22/-
The weight of steel made per shift is approximately in the ratio of...	1	1·5	2·0

Assuming, as we must, that the above figures are correct, how can we account for the fact that despite the considerably higher wages, the output from British furnaces should be only one-half of that from the German furnaces, and only two-thirds of that from the American? The reasons may be classified under two headings. In the first place the smaller output is to a large extent due to the type of plant employed and the methods under which it is operated, and in the second place the smaller output is due to the difference in the conditions of labour.

With regard to the first, there is a general consensus of opinion that the organisation of the foreign furnaces is greatly superior to that of our own. The committee state that the importance of the influence on output of the regular working of machinery and the supply of raw materials, together with the rapid and easy removal of the ingots, slag and rubbish, cannot be exaggerated. This can only be obtained with a good general lay-out which makes the management easier and encourages the men, through absence of delays, to do their best. Another point tending to make for increased output is the specialisation of production, enabling long continuous runs to be made on the same section instead of attempting to roll a large variety of sections in the same mill as is the case in British works. This necessarily minimises the delay caused by roll changing, &c. The opinion is expressed that, if the steel trade of Britain is to hold its own in open competition with the other steel-producing countries of the world, it will be necessary, amongst other changes, to have a Central Board to which all orders will go, and from whence the work will be allocated to the different works according to their ability to do it. This would save the enormous amount of capital at present locked up in stocks of rolls. Many works have

rolls for practically all the British standard sections, and change the rolls as required to suit orders. If, on the other hand, the orders were sent from a Central Board, mills could be kept on the work allocated to them for long periods, thus reducing the amount of roll changing and also the cost of production. It would also enable works to roll only such material for which their mills and plant are best adapted.

It is clear to the committee that the one outstanding feature which has been repealed by their work, so far as it has gone, has been the eliciting of the almost unanimous opinion that, if the steel industry in this country is going to maintain its position, it must be by some great broadening of our commercial organisations that would lead to economies far and away outweighing any other element in the situation, and long ago realised and adopted by our foreign competitors.

Turning now to the question of labour conditions, there can be no doubt but that the labour conditions in this country as compared with those obtaining in America and Germany are detrimental to output, although it is not suggested that this is due to inferiority of the men individually, as it is well known that the men can turn out more steel than they do at present, when they put forward their best efforts. High wages and short hours are both conducive to small production; the wages are so high that it is useless to expect men to make extra exertion to make more, and the short working week is doubly hurtful, in that the furnaces are cooled down more at the week end and consequently take longer to recover their full heat. Moreover, the committee draw attention to the objection of the men as a body to promotion by merit, and to their lack of close attention and obedience. This might be improved if careless workmen understood that they would immediately lose their jobs, but this is rendered almost impossible by the men as a body, except in cases of very gross carelessness. It seems, therefore, that in order to increase the output, it is necessary to reduce the effort required from the workman by every possible means, and this can only be done by a well laid-out and well organised plant, and in view of the great demand for steel which is certain to continue long after the war, and in view also of the certainty of keen foreign competition, there is no doubt that the steel manufacturers will be compelled to act and organise in the manner suggested.

The reasons given above apply equally well to the low output in many other trades and industries, *i.e.*, inferior organisation and the narrow outlook of labour. That we are improving the first as a result of the war cannot be doubted, and it is to be hoped that organised labour will speedily realise that in the world-wide competition that will follow the war, it has everything to gain and nothing to lose by abandoning its narrow policy of restriction of output and that it will co-operate by every means in its power in the efforts which are being made to increase the volume of the trade of this country.

UTILISATION OF EXHAUST STEAM FROM AUXILIARY ENGINES.

In a recent article in this column on the improvement of condensing apparatus, attention was drawn to the double economy effected by the efficient design of the numerous auxiliary engines used in conjunction with the main engines of a vessel, the economy resulting not only in a smaller amount of steam consumed, but also in the more efficient operation of the main engines themselves as a result of the auxiliaries performing their duties in a more efficient manner.

It has long been realised by marine engineers that, in view of the large amount of steam utilised by the various auxiliary engines, considerable economy is effected by utilising the exhaust from these engines. Three distinct methods have been adopted, the final choice of method depending largely upon the particular circumstances of the case under consideration. The original method consisted in the employment of an auxiliary or "donkey" condenser, into which the exhaust from the auxiliary machinery was led when the main engines were not running; whilst, when at sea, the auxiliary condenser was cut out and the exhaust led into the main condenser. This had the disadvantage of increasing the amount of auxiliary apparatus, piping, &c., required, and also of making it essential that all the glands and joints should be capable of withstanding a high vacuum, with the risk of a leak in any part of the auxiliary system tending to destroy the vacuum in the main condenser. The second method was therefore devised to surmount these two disadvantages.

It is well known that not only does an increase in the efficiency of a boiler result from the employment of hot feed water, but also that the life of the boiler is considerably increased in consequence; hence there are many advantages resulting from the employment of the exhaust from auxiliary engines as a means of heating the boiler feed water. If steam is allowed to expand below atmospheric pressure, its temperature falls below 212° Fahr., and it is the aim in all feed-heating devices that the temperature shall approximate to this figure so that the pressure on the suction side of the feed pump shall never exceed atmospheric, hence with the feed-heater system of utilisation of the exhaust from the auxiliaries the steam never expands below atmospheric pressure, but passes from the various auxiliary engines at 2 or 3 lbs. per square inch above that pressure, and therefore at a temperature of about 220° Fahr., into the feed heater, where it comes into contact with pipes through which the feed water is passing, and which, in consequence, has its temperature raised to very nearly boiling point before it is pumped into the boiler.

This system has many advantages over the system previously described, but it is uneconomical from the thermo-dynamical point of view, which requires that the steam shall be utilised to the lowest possible temperature obtainable. For many reasons it is not practicable with the reciprocating engine to carry the expansion of steam to its lowest limit, the chief of which is that at low pressures the specific volume of the steam—*i.e.*, the volume of 1 lb.—increases at such a rapid rate that the size of cylinders and pipes required is so great that their cost would more than counterbalance the economy gained by the increased expansion. But with turbine installations this difficulty does not present itself, since the steam is always in a state of motion, and the increase of volume can be counteracted by an increase in velocity, and hence the utmost use is made of the increased efficiency resulting from the employment of high vacua. Not only is the steam in the main engines expanded to the lowest possible limit, but the steam from the auxiliaries exhausting at about atmospheric pressure—as in the feed-heater system described above—is also led into the low-pressure turbine, where it mixes with the steam coming from the high-pressure turbine (or from the reciprocating engines, as in some well-known vessels) and both are expanded down to the lowest pressure which can be obtained in the condenser. It does not matter whether independent high and low pressure turbines are used or not, or whether the whole of the expansion takes place in one unit as in high-speed turbines, provision can always be made for a connection somewhere along the drum, so that the steam can enter into a peripheral space, at which point the pressure of the steam expanding through the turbine will be approximately the same as the exhaust coming from the auxiliaries.

Of the three systems described, the third is obviously the most simple, and it is also the most economical; but the great drawback to its adoption is that it necessitates separate feed-heating arrangements being made, and, moreover, provision must be made for condensing the steam from the auxiliaries when the ship is in port and the main engines and condensers out of service. Whilst, therefore, the second system may be described as representing the average practice amongst marine engineers, it is probable that the development of the marine steam turbine will witness the gradual adoption of the third system in some form or other, but modified to suit the peculiar requirements of marine practice.

PUBLICATIONS RECEIVED.

[*A short notice of any publication does not necessarily preclude the subsequent appearance of a longer review.*]

Watt and the Steam Age.—By John W. Grant, C.E. London : St. Bride's Press, Ltd., 24, Bride Lane, Fleet Street, E.C.4. 7½ in. × 5 in. × ¾ in. 213 pages + 8 plates. Price 7s. 6d. net.

It would be difficult to find a more appropriate title for this book, and yet we must confess that the title it bears is far from being appropriate either. We might call it a brief survey of the progress of engineering during the last 150 years, and still not cover the field included in the author's discursive remarks. It is not a biography of James Watt, for that one has to go to the standard work of M. Arago ; and yet, despite its looseness of style, we must confess to having read it with not a little pleasure. The author in his preface asserts that every new book should be able to justify its appearance by presenting some novel and useful feature, and endeavours to fulfil his assertion by tracing "the history of steam, reciprocating engines, steam turbine machinery and electricity with Watt's name and to what extent his fellow townsmen have shared in this branch of science." This comprehensive phrase is indicative of the book throughout, and yet it is not comprehensive enough, for there are many parts of the book which clearly have no connection either with Watt himself or with his fellow townsmen of Greenock. Still, as throwing an interesting sidelight on the diverse genius of James Watt, and also as pointing out the landmarks in the development of steamships, locomotives, steam turbines and electricity, the book is of interest, but we venture to suggest that the author has not quite fulfilled his own prefatory assertion.

CONCRETE BARGES.

By R. N. Stroyer, M.I.C.E. (Copenhagen).

The first field in which the application of reinforced concrete as shipbuilding material would naturally develop is that embodying smaller vessels, such as river and canal craft and vessels for coastal service, &c. Being a comparatively new material, at least as far as this particular application is concerned, builders would naturally try their hand at boats and barges for river use before attempting to construct larger vessels fit for seagoing purposes, and quite a large number of the former type of craft have been built in the last decade. An enterprising Frenchman built the first reinforced concrete boat in 1849, and the little craft is still said to be in existence, none the worse for its long service. Italy was the next country to take up reinforced concrete for this purpose, and quite a large number of barges, lighters and other river craft have been built during the last few years. The Italian Government took up the matter seriously some years ago and built a number of large barges, a photo of which was published in the *Illustrated London News* as long ago as December 12, 1908.

Altogether Italy has turned out nearly 200 concrete vessels of the river and coast traffic type, and they all appear to have answered their purpose remarkably well and fulfilled all expectations, so much so that the Director of Naval Construction, after having satisfied himself as to the practicability of using this material for shipbuilding, has now authorised the construction of larger seagoing vessels.

In Holland concrete barges have been built for some considerable time by the Cementyzer Fabrick, Amsterdam, and an illustration of one of these appeared in *Concrete and Constructional Engineering* for May, 1911.

In the same journal, in July, 1913, an American barge, built in Baltimore, 1912, was shown, the length being 112 ft., the breadth 29 ft., and the deadweight capacity 500 tons. This barge was stated to have been built for the purpose of carrying sand and ballast only.

In England comparatively little has been done in this direction, and beyond one or two small river barges nothing of importance had been built up to the beginning of the war. The tonnage question has, however, made it imperative that shipbuilding should be accelerated as much as possible, and with the prevailing scarcity of both labour and material to aggravate the situation it is not to be wondered at that the nations most affected by the submarine warfare have turned their attention to other means of overcoming the shipping losses. In England, in France, and, more particularly, in the Scandinavian countries, the possibilities of reinforced concrete as shipbuilding material are being realised, and great headway has been made in this direction during the last year or two. The advantages of this material were well known before the war, but were not always fully appreciated officially ; and if there is one thing the war has brought forward and, in a good many instances, "discovered," it is the fact of the general utility and reliability of reinforced concrete, coupled as it is with low initial cost and no upkeep. Among the points that make it particularly applicable to shipbuilding at the present moment is the fact that both materials and labour are easily obtainable and that cost and time compare most favourably with that of steel and timber vessels. The cement and ballast can be obtained at reasonable prices at most places, and the steel for reinforcement is only a fraction of that required for a steel vessel and in the shape of ordinary small round bars as against sections and plates. The labour is mostly unskilled and is the usual general contractor's class as against the shipyard type. The cost of reinforced concrete was 10 to 20 per cent. less than steel before the war, and as the immense rise in steel prices affects the pure steel structure more than the reinforced concrete one, the advantage is, if anything, still more with the latter material ; with regard to timber, it seems pretty certain that this is practically out of the question in this country during the war. Lastly, as to time for construction, reinforced concrete vessels can be built quicker because all the mould work from the first vessels can be used over again for successive ones.

With regard to the present state of development, concrete barges and lighters of deadweight capacities of from 200 to 1,000 tons are actually in commission or under construction in France and Scandinavia, both of the river and canal type and seagoing, and the leading insurance and registration bodies are taking a good deal of interest in the developments and offering facilities for approval and classification of these vessels.

Constructionally speaking, there are two distinct types of barges or lighters, the river type and the seagoing type ; whereas the first type does not present any particular difficulties with regard to design and construction, the latter has to follow more or less the same lines as for ordinary seagoing vessels. In the river type provision has to be made for the ordinary hydrostatic pressures, and the dynamic forces due to mooring, berthing, docking, &c., but in the seagoing type the longitudinal forces such as bending, shear and torsion, have also to be taken into consideration in addition to the above-mentioned forces. Even in river craft longitudinal forces may occur owing to unequal loading, grounding, &c., but the magnitude of the forces to be provided for is generally very small in comparison with that encountered in seagoing craft. For this reason river barges can be constructed a good deal lighter than seagoing ones, and consequently the cost of the former is less per ton carrying capacity than that of the latter ; thus the cost of a seagoing barge is 20 to 40 per cent. more per ton than that of a river barge.

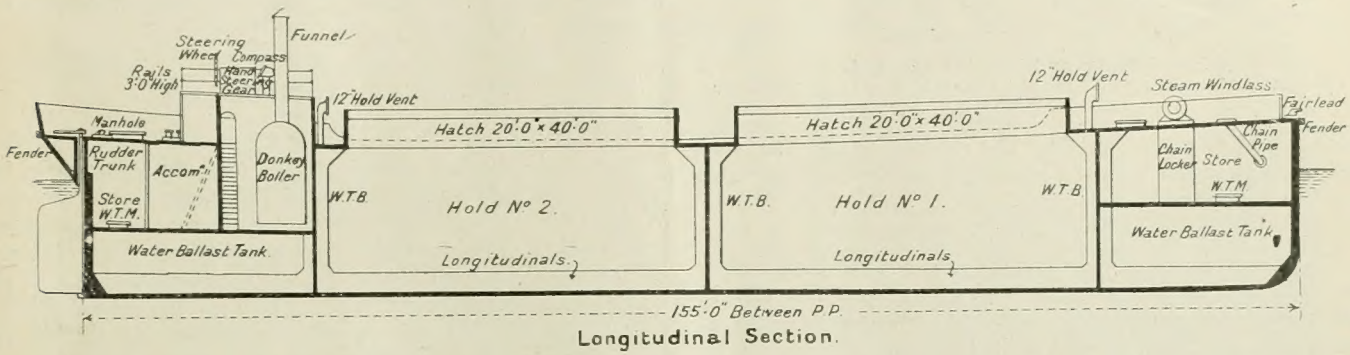
With regard to the general principles of construction, these follow the lines of a steel barge inasmuch as the hull consists of a skin supported by a framework of longitudinal and transverse beams. The arrangement of the framework may be somewhat different to that of a steel barge on account of the homogeneity of reinforced concrete, which calls for special consideration on the part of the designer.

Weight.

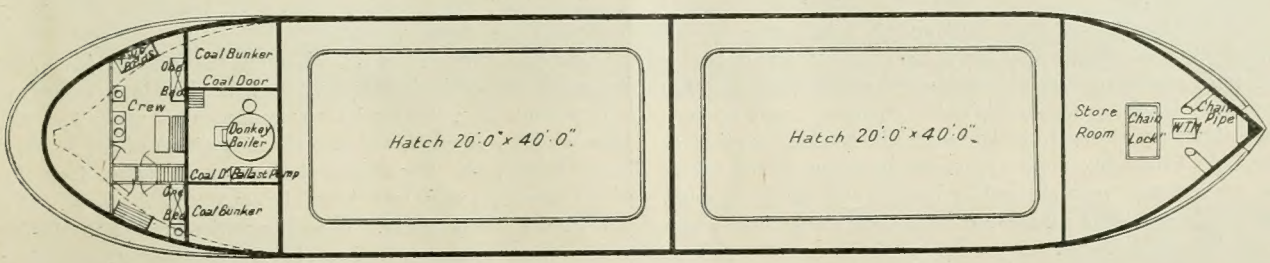
For small barges, *i.e.*, tonnages below 400 to 500 tons d.w., the weight of a concrete barge as compared with that of a timber or

steel barge of the same deadweight capacity will be found considerably greater, and the proportion is roughly this, that the hull of the concrete barge weighs 100 per cent. more than a steel barge, or the total displacement is about 30 per cent. more for a concrete barge than for a steel one; this corresponds to a linear increase of the hull of about 10 per cent. in length, breadth, and depth.

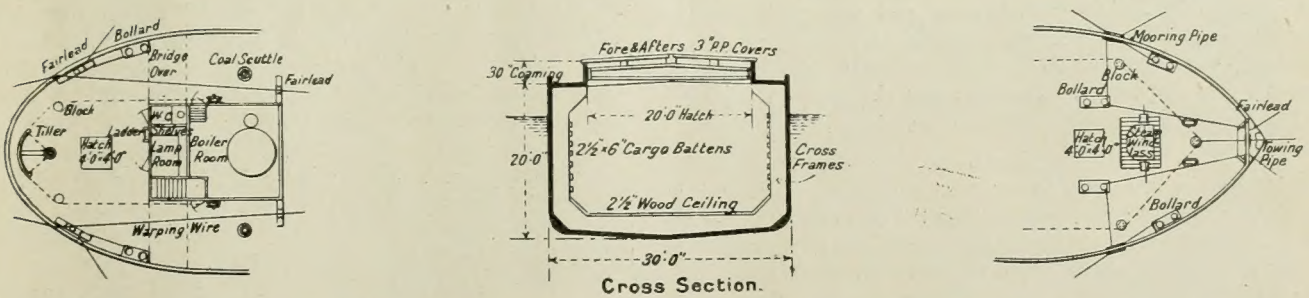
The extra weight is due to the fact that the thickness of the concrete skin and framework cannot be decreased below a certain practical limit, even if there is no call for this thickness constructionally. For smaller vessels this minimum thickness is generally in excess of what really would be required to withstand the small hydrostatic pressures met with, and it will be found that, as the somewhat upon the circumstances in which the slab is formed; thus it is easier and safer to cast a horizontal slab than a vertical one, for the reason that the former is cast with both concrete and reinforcement open for inspection during operations, and easy to handle and work, whereas a vertical slab is cast between two shutters where both work and inspection are rendered difficult. In the latter case there must be room enough between the two sides of the moulds to allow for the correct placing and holding of the reinforcement, and for the concrete to flow easily down the moulds and be worked in between the reinforcement and the sides, surrounding and embedding the bars completely. Although it is possible to cast a horizontal slab less than 3 in. thick, the bottom of the barge



Longitudinal Section.



Plan



Cross Section.

General Arrangement of 1,000-ton d.w. Sea-going Barge, built of Reinforced Concrete.

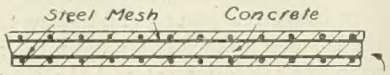
dimensions of the vessel increase, the concrete thickness can be utilised better. When the practical minimum limit is no longer the determining factor, *i.e.*, when the vessel is large enough to call for greater thicknesses than those dictated by practical reasons, the weight of the concrete hull will be found to approximate more to that of the steel hull. Thus a 1,000 tons d.w. barge or lighter would weigh about 60 per cent. more in the hull than a steel barge, which would correspond to about 12 per cent. more in total displacement, or mean a linear increase of less than 4 per cent. in length, breadth and depth. For still larger vessels the differences between concrete and steel vessels will be correspondingly smaller.

Outer Skin.

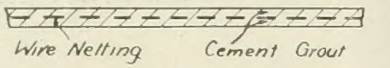
As previously mentioned, there is a certain minimum limit below which it is not practical to cast concrete slabs. This limit depends should not be less than this, so as to be able to withstand local point stresses such as may occur in berthing, grounding, &c., and which a thinner slab might not be able to distribute sufficiently. The sides and all other work cast vertically should not be less than 4 in. for the reason before-mentioned. Although 3 in. might be sufficient for stresses caused by mooring, bumping against quay sides, &c., every reinforced concrete contractor knows that even a 4 in. wall is thin enough to make a good job.

When it is considered that these thicknesses do not put concrete barges out of court as regards weight, and that they are necessary to make a satisfactory and watertight covering, it is difficult to understand why so many inventors are endeavouring to do better by constructing a skin of the wire netting and plaster type, in order to obtain something lighter than the usual cast slab. A

skin obtained by plastering cement grout on wire netting is not the same as a reinforced concrete slab and has none of the strength and rigidity of the latter; it is, in short, NOT reinforced concrete and possesses none of the advantages of the latter material. The skin must be designed to stand not only the external hydrostatic pressures, but also loads from the inside of the vessel, dynamic forces due to



Reinforced Concrete Method.
Steel reinforcement is placed at extreme fibres and used as effectively as possible.



Wire Netting and Plaster Method.
Reinforcement is in the neutral plane of the slab and useless as reinforcement.

shock, collision, grounding, &c. The concrete mixture must be sufficiently strong to produce a watertight body without having to resort to waterproofing compounds.

Framing.

The skeleton framing supporting the outer skin is composed of beams running transversely and longitudinally dividing up the skin in square or rectangular panels. In arranging the system of beams due regard must be paid to the homogeneity and monolithic character of the material, and the distribution of loads must depend on the relative strength and stiffness of the beams.

Deck, Hatches, Bulkheads, &c.

The deck must be designed to carry a certain amount of superimposed load, and special care is necessary where large openings occur, such as hatch openings, where the coamings must be constructed sufficiently strong to make up for the weakening effect of the opening. Protecting angles or channels are provided where the concrete is likely to be abrased by loading and unloading gear. The bulkheads are built monolithic with the surrounding parts, as also the bulwarks, if any.

Deck Fittings.

The surface of the deck should be treated with hardening compound or a special layer of hard wearing granite, concrete or other floor compound. All castings, forgings and other fittings to be fixed on the deck must be firmly secured by a sufficient number of anchors to distribute any stresses thrown on the fittings over as large an area as possible. The same remarks apply to any other fittings such as the fixtures for the rudder, anchor, &c.

Lines.

It is possible, of course, to construct a concrete vessel with as fine lines as desired; at the same time the cost of construction is lessened considerably if the sections of the hull can be kept constant for the greater part of the length of the vessel, as the moulds can then be used over again a great number of times. For towing barges on rivers or canals where speed is not one of the determining factors, the lines can be made very full, and even for overseas and coastal traffic, when the speed would probably not exceed 4 knots, a coefficient of 0·85 would by no means be a disadvantage. If, however, the barge or lighter is to be self-propelled and a greater speed is aimed at, a greater degree of fineness is desirable according to the speed for which the vessel is to be designed; for sizes from 300 to 1,000 tons d.w. it may, however, be safely assumed that the middle half of the length of the vessel should be kept constant, or nearly so, if the vessel is designed for medium speed.

Tests.

Before the barge is accepted it is usual to submit it to certain tests as to strength and watertightness. The former may take the shape of load tests, more particularly in the case of seagoing vessels where the conditions of loading are brought as nearly as possible into line with those producing the hogging and sagging stresses to which the hull will be subject when in commission. Racking and torsion tests may also be carried out, and under these no cracks should develop nor other defects appear in the hull.

The tests for watertightness may be carried out by loading the barge so as to immerse to the gunwale and measuring the amount of water, if any, that is leaking through the skin in a certain period of time. A small amount of leakage is of course permissible, according to the size and purpose for which the vessel is intended, it being remembered that an initial leak may ultimately take up when the pores of the concrete have been exposed to the water for some time and become thoroughly filled up.

The accompanying drawing shows a general arrangement of a seagoing barge of 1,000 tons d.w. capacity and gives a general idea of the system and arrangement of beams, bulkheads, hatches, &c., suitable for a craft of this description.

THE FIRST STANDARD SHIP.

Whilst much has appeared in the Press on the subject of the Government's standard ships, this has invariably been written in a general vein and very little of a technical nature has become known. We have learned that various classes of vessels are under construction and that the first to be completed is a general cargo vessel of about 8,000 tons deadweight; this vessel was recently launched and, as stated in our issue of September 6, has been put into commission. It may be possible, however, to gather a considerable amount of knowledge regarding this ship from the photographs which are published in this issue (see pages 297 to 300). These photographs are "official" and have been issued for the Press Bureau by the Topical Press Agency.

The first shows a standard ship on the stocks, just prior to being launched. A bird's-eye view of the deck is given from which it is possible to understand the arrangement of masts and winches that has been adopted, and also the disposition of the decks, chart house, bridge, &c. The second photograph was taken from the end of the launching ways and shows the counter of the vessel, the stern post rudder and propeller. It will be noticed that four-bladed propellers are fitted, and, as has already been announced, they are made of bronze.

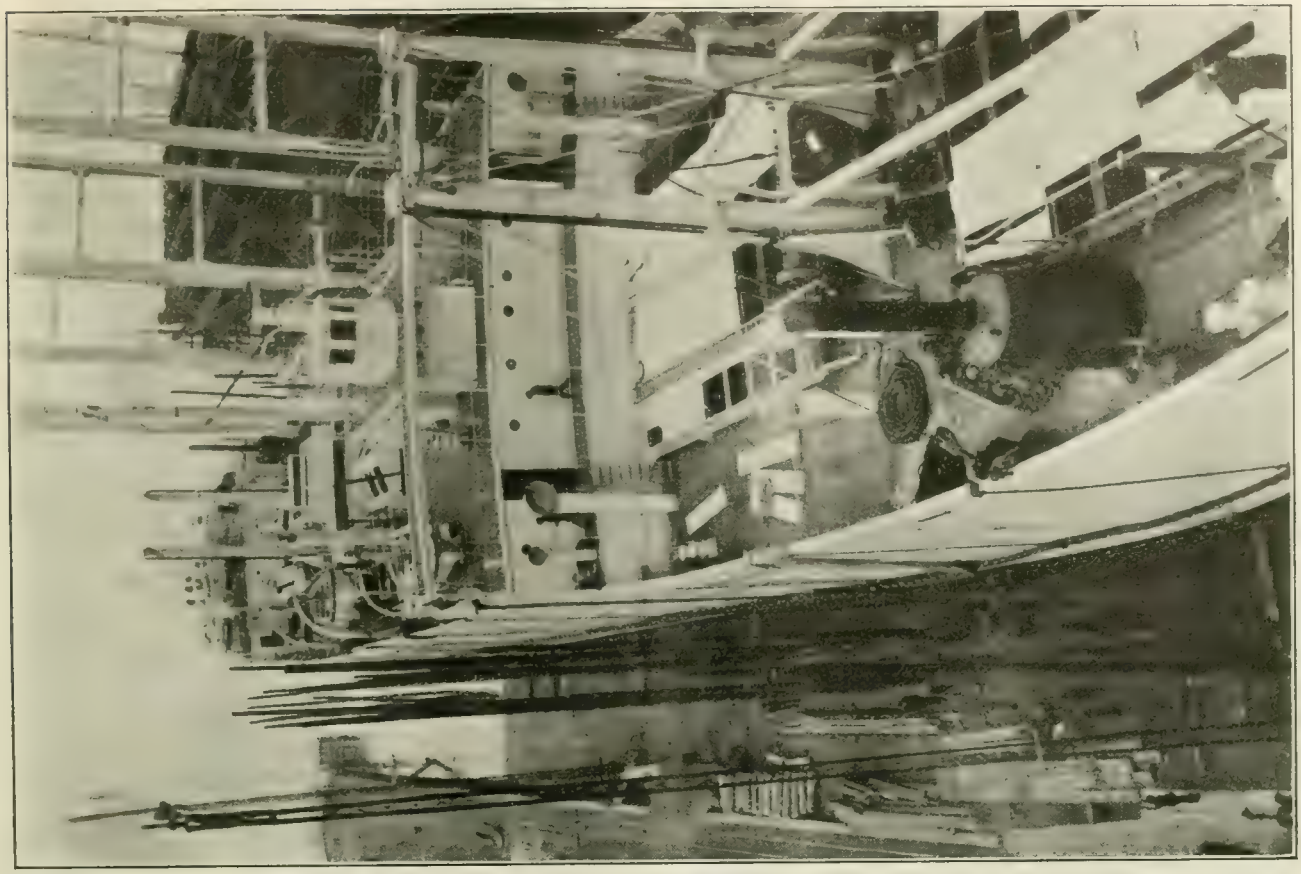
The next two photographs have been taken from the interior, and show the vessel in a rather early stage of construction. The upper picture was taken after the vessel had been framed with the deck beams in position, but the deck plating had not been laid. Whilst it is difficult to judge dimensions from a photograph the substantial proportions of the various beams and girders should be noted. The lower picture represents a bird's-eye view of the engines in the course of erection. It will be noticed that the engines are of the triple-expansion type such as are usually fitted to cargo vessels. The cylinders have not yet been placed on the columns, and the connecting rods and eccentrics are plainly visible, whilst the low-pressure link motion is just being fitted in position.

Two views of the deck taken when the vessel was in a more advanced stage of construction are next given. The first taken from the forecastle deck looking aft shows the forward cargo holds, and in the background, the officers' cabins, chart house, and navigating bridge in the course of erection, can be seen; whilst the second, looking forward from the bridge deck when the vessel was in a more advanced stage of construction than in the previous view, gives an idea of the disposition of the fittings on the forecastle deck as well as the arrangement of the winches around the forward cargo posts.

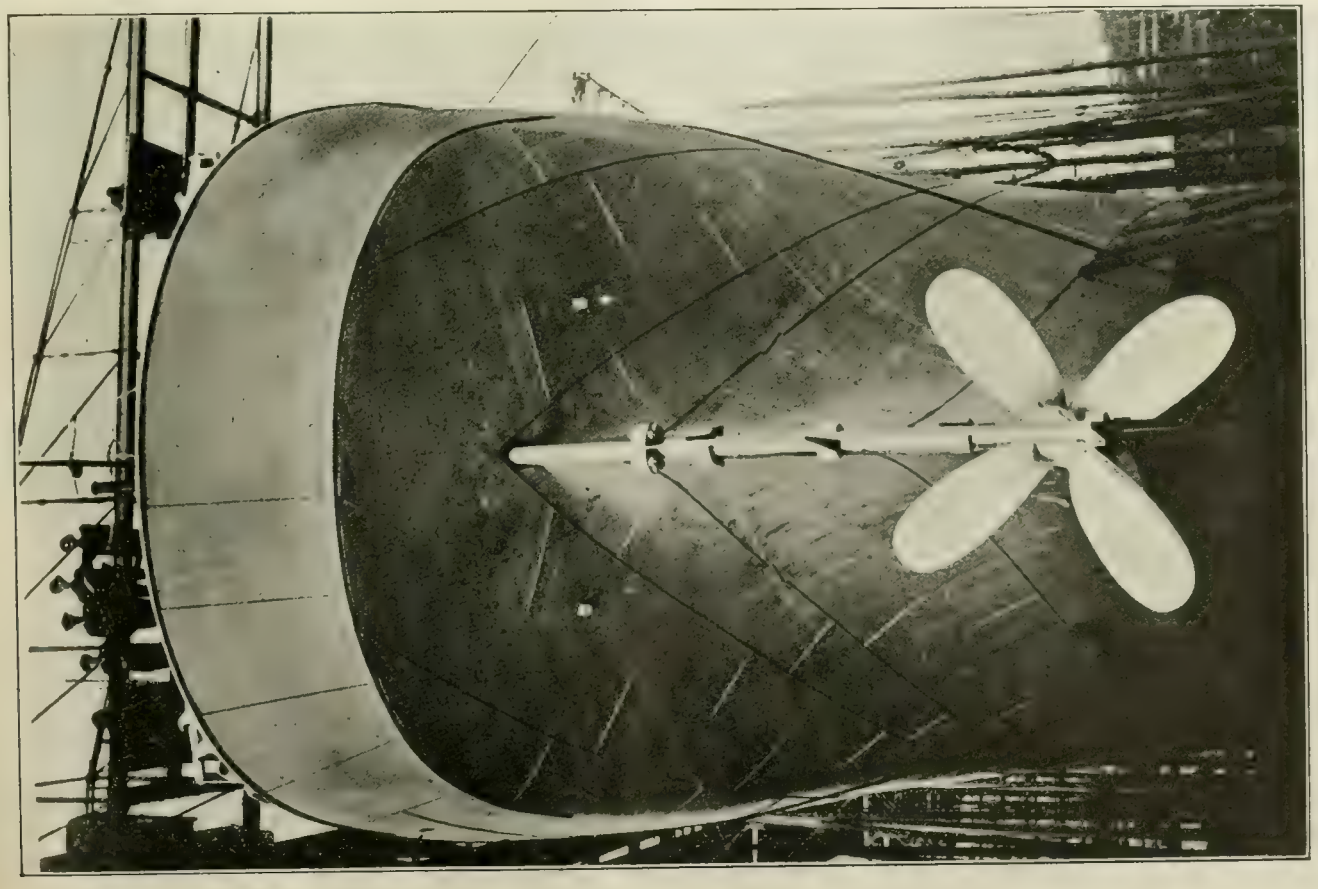
The next photograph, taken during the launch of the first standard ship, shows the vessel sliding down the ways; and it is of interest to notice that the vessel was getting near to completion when the launch took place. The last photograph was taken when the vessel, having been successfully launched, was berthed at the quayside under the crane, and already work was again proceeding.

We hope next week to publish a further series of photographs dealing with other phases of the construction and fitting out of the standard ships.

THE BRITISH STANDARD SHIPS.

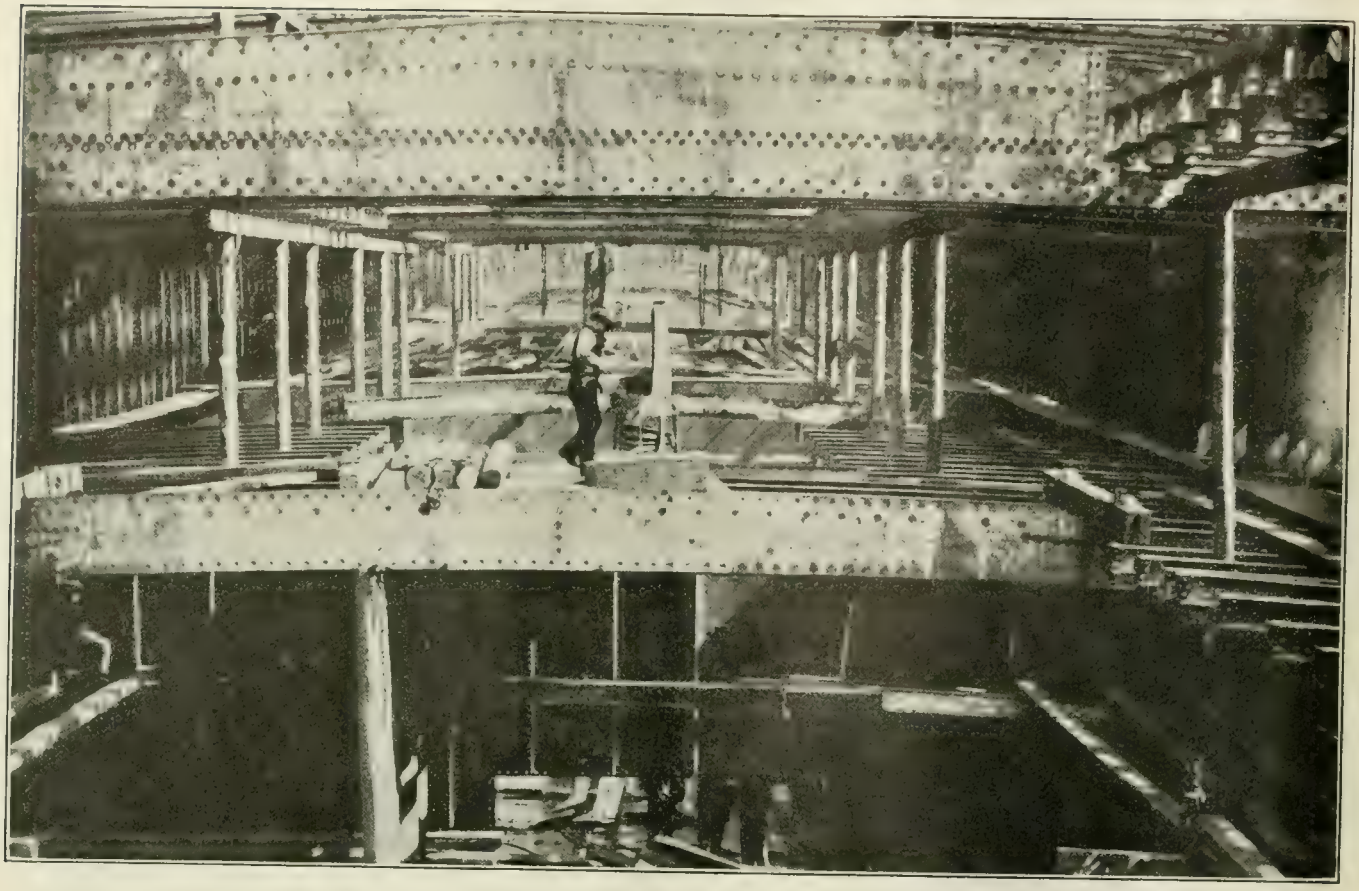


Bird's-eye View of Ship Ready for Launching.
[Official Photographs issued on the Press Day at the Depôt.



Stern View.

THE BRITISH STANDARD SHIPS.

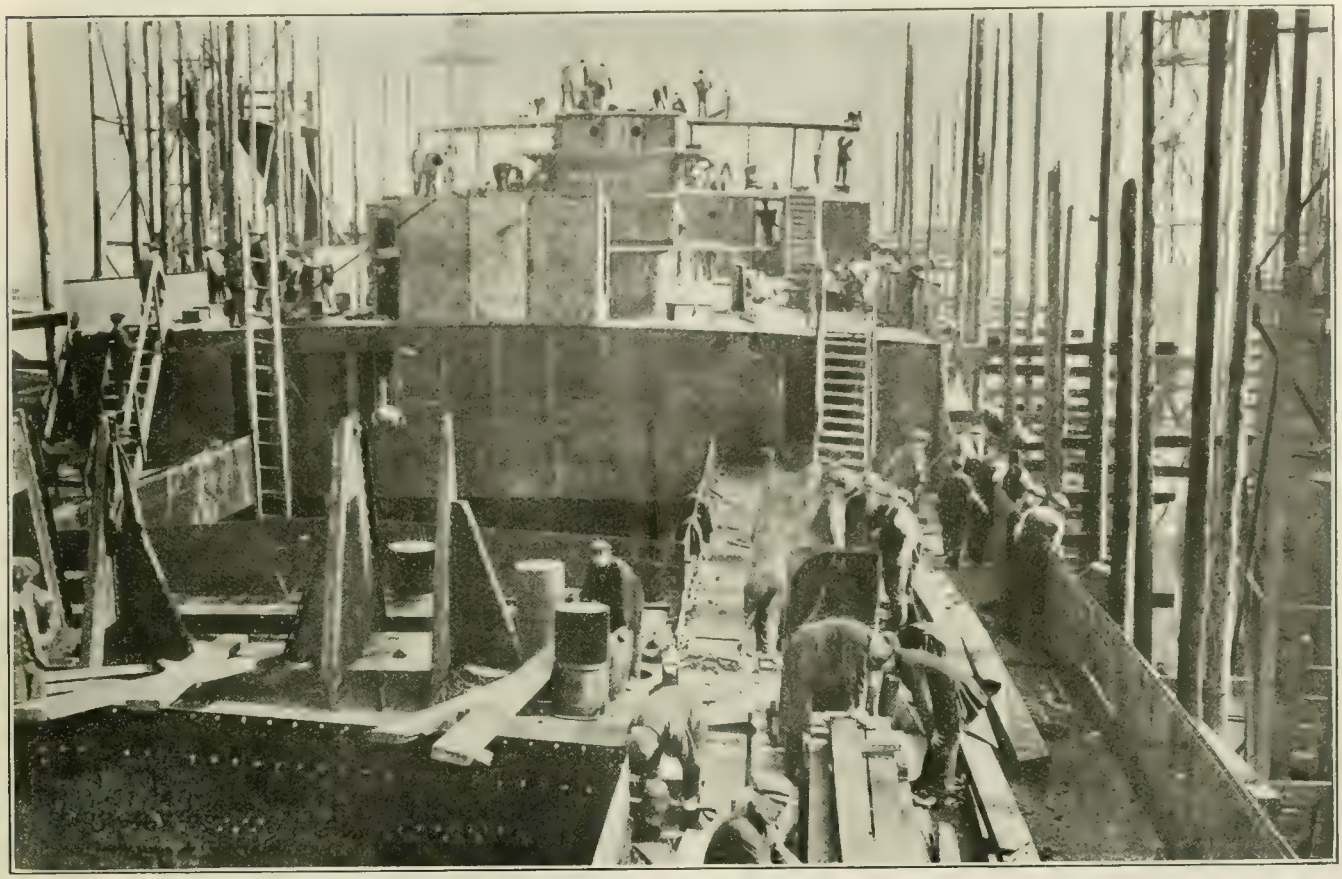


The 'Tween Decks.

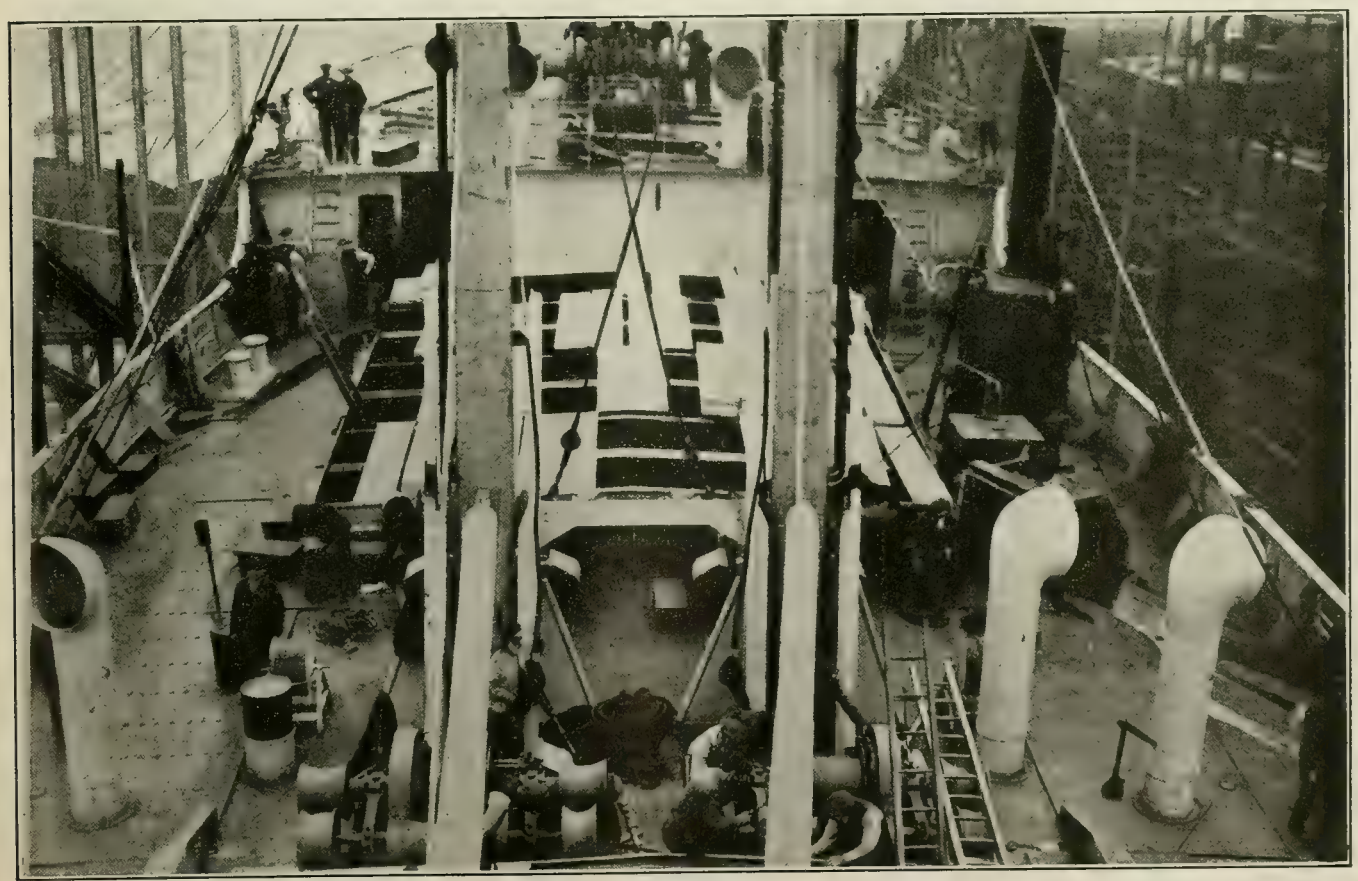
Bird's-eye View of Engine Room.

[Official Photographs issued for the Press Bureau by Topical.

THE BRITISH STANDARD SHIPS.

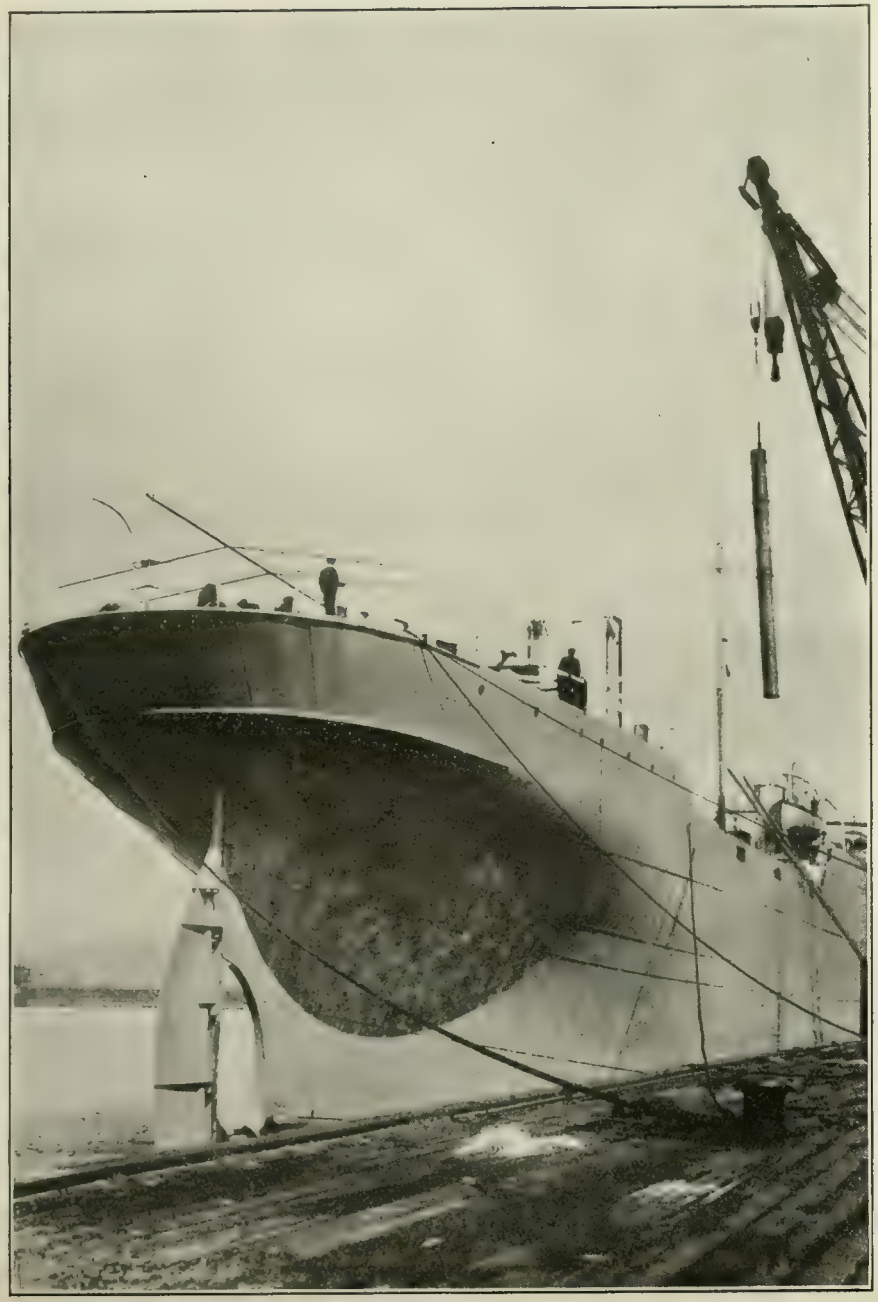


Erecting the Superstructures.



Men at Work on the Decks.

[Official Photographs issued for the Press Bureau by Topical.



Placing a Ventilating Shaft in Position.

Launch of the Standard Tramp.

THE MAINTENANCE OF THE BRITISH MERCANTILE MARINE.—IV.

In previous abstracts given of the report of the Joint Committee appointed by the Chamber of Shipping of the United Kingdom and the Liverpool Steam Ship Owners' Association we have dealt with the general aspects of shipping and shipbuilding. The following extracts discuss various methods of fostering the markets of the world.

In considering whether by the adoption of any system of preference in the Empire, or Allied, or friendly markets in which we buy and sell, we could obtain new or better openings for the sale of our own manufactures and coal, and for the purchase of our supplies, it must be recognised that the waste resulting from the war is so enormous as to affect radically the financial position of the United Kingdom in the markets of the world, and especially in the United States. The payment of the interest on the sums we have borrowed and lent will have to be adjusted by new developments in the course of the international exchange of commodities throughout the world. The greatest enterprise and energy will be needed to open up these new markets and new trades.

In shipping, the material wastage from the war has perhaps been greater than in any other industry. In some, as, for example, the cotton or coal industries, there has been a falling off in output, but the power of production has not been destroyed or lessened. In others, as, for example, engineering and its allied industries, the future power of production has been very greatly increased by war expenditure on new works and new plant, and by the training of new hands. But shipping has been diminished by war perils, and has been wasted both by the hardness of war employment and by the postponement of renewals and overhauls.

In view of foreign competition, which must be intensified by the wealth derived by neutrals from the war, it is imperative that the United Kingdom should replace the wastage of war with the utmost possible despatch. This can only be done if our powers of production are used to their fullest. To enable such powers to be so used we must be able to obtain on the best terms procurable in the markets of the world, which are consistent with other national interests, not only our food supplies but also the raw material needed in this work. And to obtain such supplies we must be able to dispose of our manufactures at the best price obtainable.

The object to be attained and the means to its attainment are therefore clear. In the employment of those means, *is it expedient that our individual manufacturers, traders, and shipowners should be aided and guided, and therefore to a certain extent controlled, by the State, or should they be left to rely on their own individual energy and enterprise?*

In regard to shipping, State aid has generally taken the form of the reservation of national trades for vessels under the national flag; but whilst such reservations aim at conferring advantages on the shipowner, they of necessity limit the freedom of the cargo owner in the freight market of the world. The policy of the old navigation laws was to reserve to vessels under the British flag the carrying trade between ports both of which were within the Empire, and to exclude from the carrying trade between foreign countries and the Empire vessels under every flag other than those of the countries from or to which the voyage was made. The laws did not exclude vessels under the flag of the foreign nation with which the trade was being carried on. In exchange for these reservations of carrying trades in favour of the British shipowners, the State imposed upon them restrictions in regard to the building and manning of their vessels.

It was found necessary, from time to time, to depart from these principles in order to obtain adequate carrying facilities for our growing trade, and also to admit into the reserved trades vessels under other flags, in order to obtain corresponding rights for our shipping in the carrying trades of those nations. When the navigation laws were abolished in 1849, it was stated that there were more voyages governed by the exceptions than by the original principles.

The British shipowners have, on the merits of their services, secured in competition with the shipping of the world the carrying of upwards of 90 per cent. of the trade between the United Kingdom and the Empire, and of at least 75 per cent. of the carrying trade between the British oversea possessions and foreign countries. So far as the Empire trade is concerned, the benefit to be obtained from the re-establishment of the principles of the old navigation laws must therefore be small, as the reservation would not exclude direct trade between the Empire and a foreign country in ships under the flag of that country.

As against any benefit to be derived from limiting within the Empire the carrying trade to the vessels under the flag of the trading nations, must be set the risk of the exclusion by way of retaliation of British shipping from the trades of other nations, and as the great sea carrier of the world the United Kingdom is open to attack in many trades.

If the Empire trades were reserved for British shipping, it is manifest that the State would seek to impose obligations on the British shipowners in exchange for what it would regard as the concession of a valuable monopoly; but a democratic Government would probably attach an exaggerated value to these advantages and therefore impose obligations the burden of which would outweigh the benefits received. The Commonwealth of Australia in conferring on the Australian shipowners a monopoly in the Australian coasting trade, has imposed obligations which have effectively excluded Australian shipowners from competing in the freight markets of the world, and in doing this the Commonwealth has secured a coasting service which, whatever its merits, is undoubtedly inferior to that which would have been provided by the shipping of the world if the monopoly had not been conferred. Further, no State by reserving national trades can give to its shipowners effective help in the general international carrying trade of the world. In that trade, ships under all flags must compete on the merits of the services they offer. A large proportion of the vessels of the British mercantile marine are general traders making voyages sometimes within the Empire and sometimes between foreign countries, and any advantages secured from the reservation of the Empire trade would be far outweighed if the obligations imposed excluded the ships from effective competition in foreign trades.

Under war conditions, the State has exercised through the coaling stations a control over vessels under foreign flags, and it has been suggested that this control should be continued and used so as to confer advantages on vessels under the British and Allied flags. In the opinion of the Committee if this suggestion is acted on it must inevitably lead to the establishment of other coaling stations on foreign territory, and the coal stored in such stations could be used to our detriment in the event of another war far more easily than coal which was stored in British coaling stations, and therefore under British control. We may have the more convenient coaling stations, but it is a mistake to suppose that other stations could not be established in foreign territory to serve the needs of foreign vessels in all parts of the world.

The Committee consider that we should encourage and develop coaling and oil stations throughout the Empire, so that the supplies may so far as is possible be under British control.

If the British shipowner is to maintain such freedom of action in the conduct of his business as he still possesses, he must be prepared to submit in all trades to the competition of the world's shipping. For these reasons the Committee believe that any return to the general principles of the old navigation laws or any attempt to exclude foreign shipping from the trade of the world by placing restrictions on our coaling stations, would be against the best interests of our foreign commerce and of our mercantile marine.

After the war it will be of vital importance that every British

shipowner should retain his liberty of action in the building and the running of his vessels. The results attained during the war from State control of shipping, manufacturing industries, and trade, only confirm this conclusion, although as a war measure such control may have been necessary.

It would not be within the province of the Committee to express an opinion as to whether industries need State assistance, or would welcome State guidance and be prepared, within certain limits, to submit to State control. It must be for each industry to place before the Nation its difficulties and its needs, so that the policy adopted may be in the interests of the Nation as a whole ; but if international commerce is not to be hampered, the policy adopted should be definite. The war policy of general prohibition, coupled with the granting from time to time of exemptions and licenses to particular traders, or to particular classes of trading operations, appears to them to be on stable lines. All traders should have equal opportunities for the exercise of their energies and enterprise, subject only, if need be, to certain clearly defined conditions, imposed only to attain national objects.

Trade Policy. Encouragement of Trade in All Markets.

Apart from the question of whether the State can help in the development of international trade in particular markets, there remains the question as to whether, and on what lines, the State can do so by facilitating and encouraging trade in all markets. Upon these lines the State can do much. The Committee give the following as examples :—

Greater opportunities should be afforded by the State for technical and commercial training, and in this training the co-operation and assistance of trade organisations should be obtained.

Collection and Distribution of Commercial Information.

The present British Consular Service is inadequate. The country does not want any spy system established, but the Consular Service should be made an effective channel through which the country is kept in constant touch with the requirements of the buyers and sellers in the markets of the world. It should study and report upon possible developments in those markets. It should secure for our traders the rights and opportunities to which they are entitled in those markets.

To discharge these duties the Consul should be a man of British nationality and of good general education. He should have been specially trained for his work under carefully selected chiefs, and as part of his training he should be brought into touch with the trade organisations of this country. His work should be supervised by travelling inspectors of proved capacity. He should be paid an adequate salary.

The information collected through the Consular Service should be made available at the earliest possible moment. It should not be buried in annual reports. Probably the information could be best distributed through the trade organisations and the trade newspapers. The trade organisations must assist. They must follow closely the information supplied, and see that it is communicated promptly to the individual traders concerned.

The Norwegian Merchant Fleet.—The tonnage of the Norwegian mercantile marine decreased by more than 400,000 tons gross register during the first half of 1917. War losses (excluding prizes) amounted to 204 vessels and 449,000 tons, or nearly 20 per cent. of the fleet ; to this must be added a loss of 29 vessels and 31,700 tons by "ordinary" causes. Norwegian yards delivered 29 vessels (20,000 tons), and foreign yards 20 vessels (58,000 tons), including ten steamships (mostly large) and one motor-auxiliary vessel from America, seven medium sized steamships from Holland, and one vessel each from Japan and Denmark. Eighteen vessels (10,000 tons) were bought from abroad, but a practically equal tonnage was sold abroad. The output of Norwegian yards is hampered by scarcity of steel ; about 169 vessels (178,000 tons) are on order with them, no fresh orders having been placed lately. Wooden vessels account for about 15,000 tons and motor ships for 20,000 tons.

DIFFICULTIES OF SWEDISH SAILING SHIPS.

The Swedish Sailing Ship Union gives the following example as showing the difficult position of owners of sailing vessels and, in particular, their inability to sustain any part of the cost of the proposed tug service at Stockholm. The case considered is that of a 120-ton schooner going from Raa to Limhamn in ballast, thence to Oernskoldsvik with cement, and from there to Copenhagen with timber. The value of the vessel is placed at its present "replacement cost," viz., £3,310. Favourable conditions are assumed for it is often impossible to obtain a cargo from north to south ; also, it is not often possible to keep in service for ten months per annum. Receipts are estimated at 10 kr. per ton to Oernskoldsvik, and 75 kr. per standard to Copenhagen, making £385 in all. The round trip has actually occupied two months, during which time the outlay on premiums for hull insurance, war insurance, accident insurance and so forth, amounts to £104. Wages, repairs, harbour charges, provisions and other expenses for the round trip amount to £214 so that the surplus of receipts over outgoings is £67. If one allows 8 per cent. depreciation and 6 per cent. interest on capital, there is a deficit of £25 10s. The only way to avoid certain loss is to under-insure, *i.e.*, to insure for less than the present replacement price, which is obviously risky. Owners who have already enjoyed war profits for a year or two and accumulated large reserves may afford to carry this risk, but matters are very different for anyone purchasing vessels at present prices. In other words, the price of vessels has already been driven beyond the limit of economic security and sound finance ; it is difficult, if not impossible, to cover the present value of vessels and at the same time to show a reasonable return on the latter.

GERMAN ARCHIVES FOR SHIPBUILDING AND SHIPPING.

A short time ago there was founded in Hamburg an association for establishing and maintaining archives for shipbuilding and shipping, wherein should be collected, arranged and placed at the disposal of members, all technical and economic literature bearing on these subjects, all available news, and catalogues and other trade publications. The archives will cover sea and river shipping and shipbuilding and allied subjects and the sole aim of the association is to be of general utility and to serve the scientific, technical and economic interests of shipbuilding and shipping in the widest possible sense. It is proposed to commence by establishing the following sections :—(*a*) Technical section containing literature in book form, periodicals, pattern books, patent specifications, &c. (*b*) Economic section containing information relating to firms, professional and technical associations, various countries, raw materials, laws and regulations, insurance matters, social arrangements, ship's hygiene, &c. (*c*) A section for annual and special reports. (*d*) Section for maps, plans, standard drawings, photographs and so forth. (*e*) General index and reference section. A public reading-room is to adjoin the archives and the issue of current reports is under consideration. The association has already over 150 members, including the principal companies and leading persons in shipbuilding, shipping and associated industries from the whole of Germany and Austria-Hungary. Sufficient funds have been subscribed to make possible an immediate start in accumulating the archives which are to be located in the Monckeberg Strasse, Hamburg. The first council of the association includes Prof. Dieckhoff (Hamburg) as president and Marine Surveyor Dip. Ing. Albretch (Hamburg) as vice-president.

Belomorski Lloyd.—The *Frankfurter Zeitung* announces that this company is being established in Sofia with a capital of £396,000, to be derived from Bulgarian, German and Austro-Hungarian sources. The new concern is described as an Aegean steam shipping company.

GENERAL NEWS SECTION.

PERSONAL.

Mr. Roger Beck, the well-known Swansea docksman, has set aside £10,000 towards the cost of erecting an orphanage at Swansea.

Mr. George Lunn, of Lunn & Maccoy, shipowners, has acceded to the request of his colleagues on the Newcastle City Council to continue in office for a third year as Lord Mayor of the city.

Chief-Officer A. McComb, of Sandringham Road, Cardiff, has been awarded the Honorary Vellum of the Royal Humane Society for having rescued the master of another vessel while in Gibraltar Harbour.

Captain W. H. Kelly, formerly Chief Officer of the Pacific Steam Navigation Company's steamer *Orcoma*, has been awarded the D.S.O., and received the rating of commander in the Royal Navy, for meritorious service during the war.

Capt. W. Proctor, Master of the Cardiff steamer *Devon City*, died recently at Karachi. Deceased, who was a native of Liverpool, had been with W. R. Smith & Son, Cardiff, for about three years, and for about 20 years previously with Thompson, Anderson & Co., Liverpool.

Sergeant Archibald Currie, Royal Field Artillery, who was gazetted to the award of the Distinguished Conduct Medal last week, is one of Harland & Wolff's engineering apprentices. He received the medal for getting ammunition through to his gun position under difficult conditions, in which he displayed the most conspicuous gallantry and devotion to duty.

At the annual prize-giving in connection with the Wellesley Training Institution, formerly a training ship until the vessel was destroyed by fire on the Tyne a few years ago, at Tynemouth, Mr. J. G. Hagan, who has retired after 34 years' service on the official staff, was presented with a case of books, the case being made from wood out of the old Wellesley training ship.

The death has occurred from the effects of an operation, at Larne, of Lieutenant Thomas Raines Blanshard, R.N.R., formerly of the Bibby Line, Liverpool. The deceased officer was 43 years of age, a native of Lancashire, and the eldest son of the late Captain Blanshard, R.N. He commanded the *Herefordshire* in the Liverpool, London, Rangoon, Colombo Service, for five years, and had been on naval service for the greater part of the war.

On September 20 the death occurred of Sir Edward Hain, at his residence, Treloyhan, St. Ives, Cornwall, in his 67th year. Sir Edward was Chairman of the Hain Steamship Co., Ltd., and a member of Edward Hain & Son, St. Ives, Foster, Hain & Co., Cardiff, and Foster, Hain & Read, London. He was born in 1851, and was the eldest son of the late Mr. Edward Hain, shipmaster, of St. Ives. The important steamship company of which he was senior partner, Edward Hain & Son, was founded by him in 1878, when the first steamer of the fleet of merchant vessels, constructed by John Readhead & Sons, South Shields, was launched on the Tyne. Since then over 50 vessels of the cargo-carrying type have been built for the firm by John Readhead & Sons, who have enjoyed a monopoly of their orders for new tonnage. In 1881 a partnership was established in Cardiff with Mr. R. A. Foster, and six years later an office was opened in London, the respective concerns being carried on under the title of Foster, Hain & Co., Victoria Buildings, Bute Street, Cardiff, and Foster, Hain & Read, St. Mary Axe, London, E.C. Sir Edward was elected President of the Chamber of Shipping of the United Kingdom in 1910, in which year he also received the honour of Knighthood at the hands of His Majesty the King. Subsequently and until his death he served as a member of the Executive Council of the Chamber of Shipping, and since June, 1913, he had been a member of the Committee of Management of Lloyd's Register of Shipping. In 1914 he was elected Chairman of the London General Shipowners' Society, and had since acted in the capacity of Treasurer. From 1900 to 1906 he represented the St. Ives Division in the House of Commons as a Unionist, but he was compelled, owing to increasing demands of his profession outside the House, to relinquish his Parliamentary career.

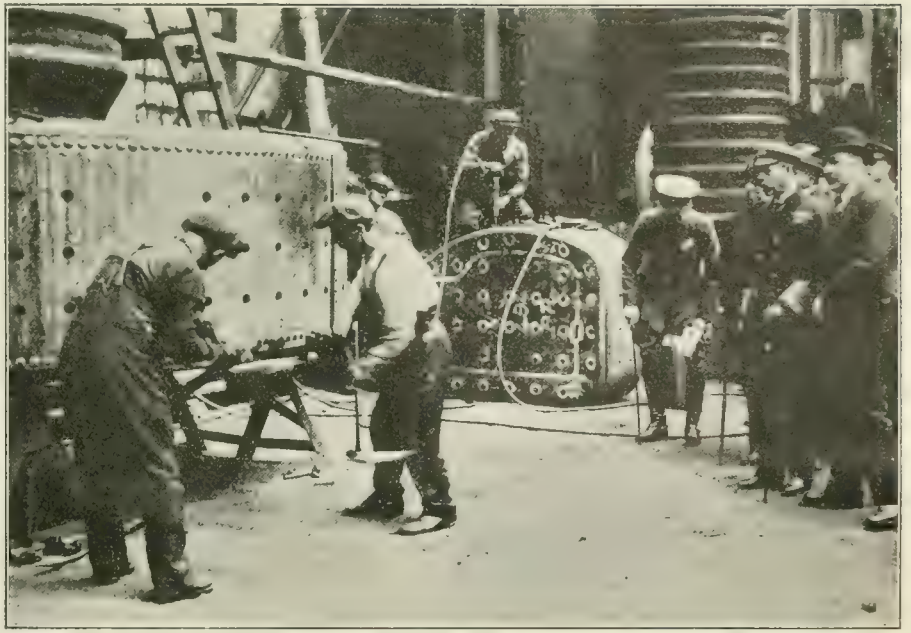
Mr. George Hicks, whose death recently took place at Heathfield, Sussex, may be deemed the originator of the Manchester Ship Canal. In 1876 Mr. Hicks, who was at that time agent in Manchester for the North China Marine Insurance Company, conceived that the River Irwell might be made useful for communication with the sea. At the end of the following year he promoted a petition to the Manchester Chamber of Commerce for an inquiry into the possibility of making the river navigable for deep-sea steamers. He also persuaded Mr. Fulton, a London engineer, to make an engineering report, and also secured the aid of Professor Boyd Dawkins to report upon the geological aspects of the matter, while he himself prepared a review dealing with the financial and commercial possibilities of a navigable waterway. At that time the suggestion was that of a tidal navigation, but this was subsequently abandoned. Mr. Fulton's scheme was discussed by the Chamber, and in April, 1877, at a special meeting, a resolution was passed that a ship canal and docks at Manchester would be of great service to the trade of the city and district. Owing to commercial depression and other causes nothing further was done until 1881, when the project was revived. In the following year the first provisional committee was formed, and Mr. Hicks took a prominent part in the preparation of the Parliamentary bills, the raising of money, and other necessary matters. For several years he acted as auditor of the Manchester Ship Canal Company, and lived to see the undertaking carried to a triumphant issue.

THE KING'S TOUR OF THE CLYDE SHIPYARDS.

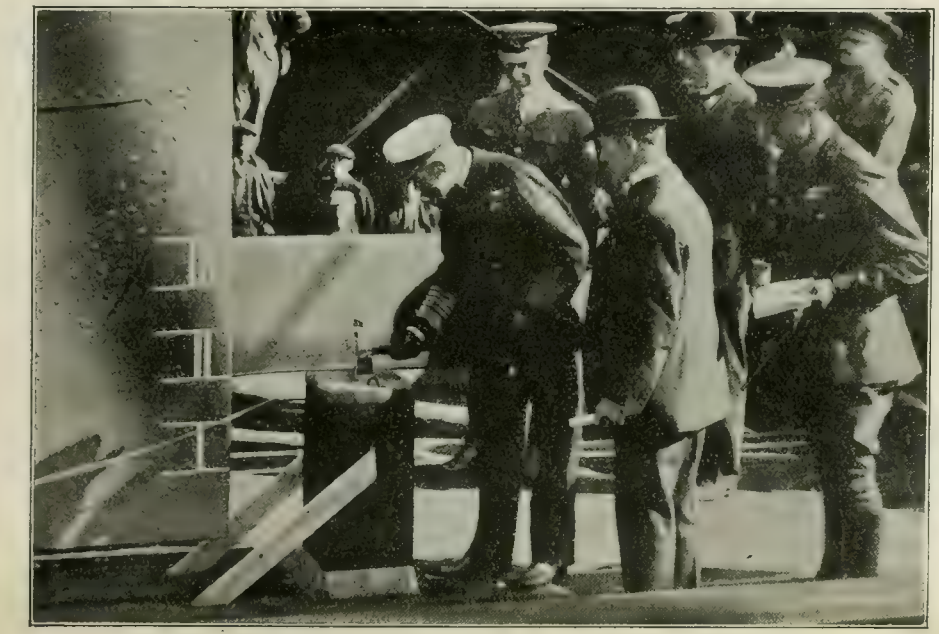
We published last week the full programme of the King's visit to the Clyde shipyards, from which it was apparent that the most comprehensive arrangements had been made to enable His Majesty to see the strenuous efforts which are being made in every department of our great shipbuilding industry to complete with the greatest rapidity vessels to replace those sunk by the enemy, and at the same time to still satisfy the demands of the Admiralty for vessels required to keep our naval forces at the highest possible efficiency, and to add to the ever-growing number of vessels required to hunt the German undersea boats.

The daily press has recorded the enthusiasm which attended every day's progress, and it is unnecessary for us to dwell upon the undoubted success of the tour. We publish on page 304 four photographs illustrating typical events which crowded upon each other during the four days the King was on the Clyde. The first photograph shows a group of workers of the Clyde Shipbuilding Company cheering His Majesty as he passed through the yard. The next photograph depicts one of the many processes in engine and ship building which the King witnessed; it represents riveters at work on the combustion chambers of marine boilers in the works of J. & G. Kincaid & Co., Ltd. At the works of the Greenock & Grangemouth Dockyard Company, Ltd., the King launched the sloop *Hibiscus*. In the third photograph His Majesty is seen cutting the cord and thus releasing the weights which knocked away the dog-shores; whilst the last photograph shows the *Hibiscus* just taking the water.

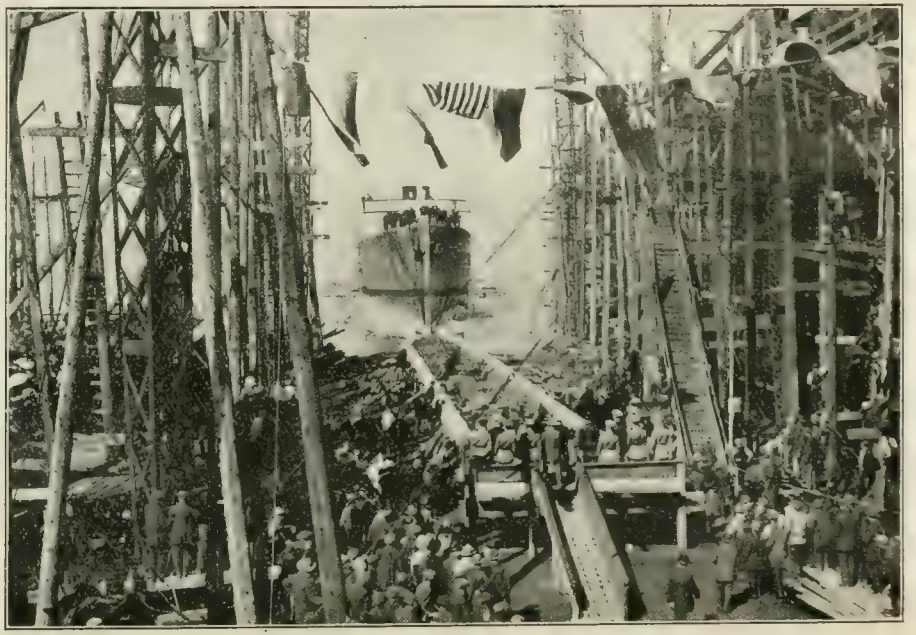
The King and the Workmen of the Clyde Shipbuilding Company.



The King watching Riveters at Work.



The King Cuts the Cord and Launches a Ship at Greenock.



General View of Launch at Greenock.

FROM OUR CORRESPONDENTS.

CLYDE AND DISTRICT.

(From Our Own Correspondent.)

The King in Scottish Shipyards.—The tour of the Clyde shipyards and steel works which the King concluded on Thursday last has undoubtedly established a new bond of interest and sympathy between the Sovereign and his subjects in what he himself described as one of the most important industrial centres of his kingdom. The tour which was arranged with the primary object of letting the King see what was being done to increase the mercantile tonnage of the country at a critical period of its history, has attained a two-fold object. Not only has His Majesty learned at first hand the measures which are being taken to ensure the food supply of the country, but his presence in the workshops will have the effect of stimulating the workers to still greater efforts. An outstanding feature of the tour was the fact that the King confined his attention mainly to the yards in which mercantile tonnage is being constructed. Beginning with Greenock and Port Glasgow and ending with Paisley His Majesty saw a greater variety and a greater volume of mercantile tonnage being built than is to be found in any other district in the Kingdom. It is noteworthy that at Paisley the King took part in the launching of three vessels, one from each of the yards visited. In the course of his tour he paid special attention to the construction of standard ships, first in the Lancashire steel works, where the plates for these vessels are rolled, and then in the various Clyde shipyards where there are a number of standard ships in various stages of construction.

Dock Extension at Kirkcaldy.—Among the Scottish port authorities which are making provision for a large expansion of their shipping trade after the war the Harbour Committee of Kirkcaldy Town Council is taking a prominent place. A scheme has been drafted by the Committee which, if fully carried out, will go a long way towards putting Kirkcaldy in the forefront of the smaller ports on the Firth of Forth. The proposal is to reclaim a piece of ground extending from Redburn Wynd to the South Pier. In this space it is proposed to construct two dry docks, one 400 ft. by 60 ft., and the other 350 ft. by 50 ft. The entrance to the docks will be from the outer basin of the present harbour. Under the reclamation scheme several acres of ground will be available for the erection of workshops. By a special arrangement the dry docks will be emptied by the ebbing tide, and pumping will thus be saved. No estimate has been prepared of the probable cost of the scheme, as the work cannot be undertaken till after the end of the war. The proposed docks will be made large enough to accommodate all types of destroyers and submarines.

Greenock and the Scottish Ship Canal.—Greenock Town Council, or at least some of its members, appear to be reconsidering their attitude towards the proposed construction of a ship canal across Central Scotland by the direct route via Glasgow. The Council has already passed a resolution in support of the direct route as opposed to the route by Loch Lomond and Loch Long, but the matter was again raised at a meeting of the Council last week. Sir Hugh Shaw Stewart, who dealt at some length with the probable effect which a canal by the direct route would have on Greenock said it would probably be the end of Greenock as a shipping centre. A skilled civil engineer he said had indicated that if the proposed canal were taken by Glasgow he did not see how it would be possible for large battleships to be taken by that route unless the canal was cut through the tail of the bank, which was of such vital interest to Greenock, because the sweep of the ebbing tide kept their harbours clear. At present battleships came down the river light, just after launching, but if they came through the canal they would probably be loaded with guns, coals and stores, and it would be practically certain that it would be necessary for them to go round the edge of the harbours of Greenock. There were also other considerations. With the outlet of the canal at Glasgow more docks would be required there, and the more docks there were at Glasgow the less need there would be for docks at Greenock.

Leith Dock Rates Increase.—In order to meet the increased expenditure at Leith Harbour the Dock Commission made application recently to the Board of Trade for permission to advance the rates on goods and shipping up to a maximum increase of 33⅓ per cent. The Commissioners have now been empowered to make the necessary advances, but it is not anticipated that they will immediately raise all the rates to the full level permissible under the Board of Trade's recent order.

NORTH EAST COAST DISTRICT.

(From Our Own Correspondent.)

Free Scholarships for Wireless Telegraphy.—An attractive development in connection with the Department of Wireless Telegraphy at Rutherford Technical College, Newcastle, an enterprising section founded through the generosity of local shipowners, is that the Marconi Company, who have numerous vacancies on their operating staff, are prepared to award a number of free scholarships to suitable applicants between the ages of 16 and 18 years. The successful applicants will be trained at the College at the expenses of the Marconi Company, and immediately on completion of their tuition they will be employed in the merchant service with the rank and pay of junior officers. There can be little doubt that the work of a wireless operator at the present time is entitled to be regarded as of real national importance, and therefore it is hoped to attract a goodly number of local youths to the advantages now held out by the College to take up this new profession. This scholarship scheme is calculated to increasingly popularise the career of seagoing operators, and the Principal of the Wireless Department at the College hopes to draw a good many enquirers in the next week or so.

Status of Workers.—The semi-skilled and skilled workers have proved themselves so valuable during the present war in the leading industries, such as those of shipbuilding and engineering, that it is tolerably certain they will seek through the medium of organisation to improve their status when normal times return once again. There has been a certain atmosphere of superiority in the past among the skilled trade unions, and thus there has been rather a gulf between them and the semi-skilled societies. During the war, however, the latter have come much more to the front, particularly in wages questions, and they have shared equally with the skilled unions when advances have been obtained. The National Federation of General Workers, recently formed, and which succeeded the General Labourers' National Council, established in connection with the General Federation of Trade Unions eleven years ago, is symptomatic of the tendency of aspiration among the unskilled trades. We get a glimpse of what is aimed at in the future in a sentence contained in the current report of Mr. J. N. Bell, general secretary of the National Amalgamated Union of Labour, Newcastle, who took a leading part in the formation of the Federation of General Workers and was previously secretary to the General Labourers' National Council, when he says, "The new organisation has a chance to be a powerful factor in deciding the status of the so-called unskilled, for it has a membership of half a million among the seven unions at present affiliated to it, and can, therefore, speak with some authority in matters concerning those unions."

Speaking of unskilled labour it has to be noted that the war has given a rather remarkable impetus to the strengthening of the organised ranks among this class of worker. The National Amalgamated Union Of Labour, of which we have just spoken, affords an illustration in this connection. It has a good many members in the shipyards and in the marine engine shops, and when it was established twenty-eight years ago it had only a small membership, labouring men at that period being mostly indifferent to the trade unions. For many years afterwards the membership did not exceed twenty thousand, but to-day the total is 101,436 with accumulated funds amounting to £52,930. Other similar unions have made considerable progress, and thus when the war is over employers will not have to be unmindful of the fact that lesser-paid labour has grown very appreciably in the organised sense since the present war began.

Workshop Committees.—Employers' Association and workmen's trade unions prefer to conduct their negotiations in matters of wages and working conditions with a minimum of State interference. They know their own affairs best and can usually get along quite well without the advent of a third party. There has been such a welter of committees in the past three years that most people are getting very tired of the mere mention of them, and when yet another is suggested it is usually received with implied dissent and unmistakable coldness. The Advisory Committee to the Ministry of Munitions is to be asked to deal, it is understood, with the formation and establishment of Works or Workshop Committees, and in the opinion of the organ of the Iron and Steel Trades Confederation this in itself raises a number of questions which cannot be dealt with casually or settled off-hand. "It may," says the report "be undesirable to agree to these committees being established for the iron and steel industry. The principal trade unions in this industry have been responsible for the establishment and maintenance of the existing machinery for the regulation of wages and conditions

of employment, and it is for us to decide as to whether or not we are to scrap this machinery in favour of a proposal which tends to encourage the very worst features of sectional organisation, and will inevitably lead to divided counsels when unity of purpose and action are absolutely essential for the well-being of the trade."

Education of Apprentices.—It is well at the present time, when so much is heard of the need there will be in the future of improving the technical education of apprentices that some cognisance should be taken of the recreational side of their life. Any well-ordered scheme must include facilities for exercise if the best results are to be obtained in the college and the workshop, the two being intended to work more closely together in the years to come than they have done in the past. In this matter of devising a playing hour as well as a time for manual work and for study, the firm of R. & W. Hawthorn, Leslie & Co., Ltd., on the Tyne, have set an example that is worthy of emulation. In connection with their Hebburn shipyard they have an Apprentices' Welfare Committee, and under its direction a recreation ground has just been opened formally by the managing director, Mr. J. T. Batey, where it is proposed to provide football during the winter months and cricket and tennis in the summer. Physical culture classes are being promoted by the Committee, and educational work is also being fostered in every possible way.

Rates of Wages.—Practically all classes of river and dock labour have been seeking advances in wages in the last few months, and negotiations completed between the employers and the men's representatives have resulted in increases for men employed by transport firms and timber merchants on the Tyne and Wear and at Blyth. Between two thousand and three thousand men are affected by the advances which come into operation as from September 3. The increases on the existing rates are to be regarded as a war advance and to be recognised as due to and dependent on conditions arising out of the war. Timber dischargers now earn as high as 11¾d. an hour and up to 1s. 3d. for overtime. The Tyne hopper men are now seeking an advance of ten shillings per week on current rates, with 2s. extra for work above Newcastle bridge, time and quarter for all overtime, and double time for all labour on Sundays, Christmas Day, New Year's Day, and Bank Holidays.

MERSEY DISTRICT.

(From Our Own Correspondent.)

"Peregrine" Inquiry.—The Board of Trade inquiry into the stranding of the steamship *Peregrine* having resulted in the second officer's certificate being suspended for two years, the Imperial Merchant Service Guild, of which body the officer is a member, has just decided to enter an appeal "against this extraordinarily severe sentence."

Rapid Discharge of Cargo.—Williams & Jones, master porters, &c., have effected a rapid discharge of a steamer in the Liverpool docks. In 26 working hours, that is from 7 a.m. on September 18, to 10 a.m. on September 20, they discharged a cargo of oil, roughly about 3,500 tons, in barrels and cases with the ship's own gear, and without the assistance of cranes. This smart turn round of a ship calls for notice in the present circumstances of shipping and labour.

Port Charges.—Another increase in the port charges at Liverpool is to be recorded. The Mersey Docks Board on Thursday after conceding a further war bonus of 6s. per week to the employees in the warehouse department, decided to make a further advance of 15 per cent. in the warehouse rates and charges. These latter are now 66 per cent. over the published book rates, while the war allowance to warehousemen will now be 20s. per week over their pre-war wages.

Mr. R. D. Holt, M.P. (Alfred Holt & Co.) made a protest and a warning against both these advances. In regard to the war bonus to the warehousemen, Mr. Holt said the taxpayer was going to have to bear a large part of this burden, while the class who were already receiving large financial benefits and were almost entirely exempted from any additional taxation would have their position still further improved.

In regard to the increase in warehouse rates Mr. Holt questioned whether this was legal, and if he were a customer of the warehouses he would certainly contest the right of the Board to make charges in excess of those which Acts of Parliament had authorised.

The chairman having assured the Board that the proposed increases were quite legal, they were agreed to.

Standardising Marine Engines.—The committee appointed by the British shipbuilding and engineering organisations and classification societies, to proceed with the standardising of marine engines, includes the following members of the Liverpool Engineering Society: Mr. Willett Bruce, superintendent engineer, White Star Line; Mr. S. Freeman, superintendent engineer, Holt Line; Mr. J. Hamilton Gibson, engineer manager, Cammell Laird & Co., Birkenhead; and Mr. J. B. Wilkie, superientendent engineer, Elder, Dempster & Co.

Appreciation.—The British Chamber of Commerce in Rio de Janeiro have cabled to the Mercantile Marine Service Association in Liverpool an expression of their high appreciation of valuable services rendered by both officers and men of the British Navy, Army, mercantile marine and Allied forces, and their profound gratitude for self-sacrifice all are showing in safeguarding national and commercial interests.

SOUTH WALES DISTRICT.

(From Our Own Correspondent.)

Shipment of Coals to Italy.—The Cardiff Local Committee for the supply of coal to France and Italy have issued the following notice:—Coal exporters to Italy are informed that it has been arranged with the Italian Government Commission, that new licences for the export of coal into Italy shall be issued with validity for the quarter November to January in pursuance of new authorisations to be issued by the Italian authorities. As licences now extant are valid only until the September 30, it has been decided that validity of all licences which may be valid at that date shall be automatically extended until midnight of October 31, 1917, and the necessary instructions have been communicated to the Collectors of Customs, so that in the case of licences affected by this arrangement, no application to the War Trade Department for extension will be necessary.

Shipyard Workers and Submarine Menace.—Mr. John Jenkins, on Friday, presided over a conference of shipyard workers at the Law Courts, Cardiff. Major R. Williams, who attended on behalf of the Admiralty, addressed the conference. The proceedings were held in private, but it is understood that he dealt in a forcible manner with the situation in regard to the submarine menace, and urged the workers to do their utmost in the work of construction of new tonnage and repair of vessels. The views put forward by Major Williams were received in a very sympathetic manner by the workers.

Bristol Channel Shipbuilding Facilities.—The Bristol Channel and its ports have lately been much in evidence in shipping intelligence. The important announcement of the Admiralty in regard to Chepstow occupies the premier position. The scheme which is being promoted for establishing a shipbuilding yard at Newport is proceeding satisfactorily, and it is anticipated that the negotiations for acquiring the necessary land will be completed shortly. The intention of the syndicate, it is stated, is at the outset to lay down four slips. At Swansea, negotiations have been proceeding with the Harbour Trust for the building of a new dry-dock. This project was initiated some time ago, and it is stated that the promoters have been successful in carrying through the arrangement with the Harbour Trust. The dock is to be capable of docking the largest vessels afloat. The position of the Cardiff scheme for erecting a large shipbuilding yard is, at present, obscure. It is believed that negotiations are still proceeding, but no information is, at present available.

School for Study of Marine Navigation.—The initial step for the establishment of a school at Cardiff for the study of marine navigation has been taken by W. R. Smith & Son, shipowners, Cardiff. At a meeting of the Cardiff Technical Instruction Committee, the following letter was received from the firm:—"We think it would ultimately prove to be of great benefit to the mercantile marine if it were possible to form, in connection with the Cardiff Technical College, special classes for boys, say, between the ages of 13 and 16, for the purpose of studying navigation, seamanship, &c., to fit them for a seafaring career. We suggest further that special classes could be formed to enable sea-going apprentices and others to study for their Board of Trade certificates. Such classes, we understand, have proved to be of great value in other shipping centres. Now that the Bristol Channel is likely to become a shipbuilding centre, would it not be of great advantage to the district if mercantile marine officers and engineers were given the opportunity of studying ship construction? If something could be done by the Committee interested on the lines indicated, we should be only too pleased to give the sum of £2,000 towards this branch of the work." The Committee directed Principal Coles to report fully on the proposal.

Recent Arbitration Cases.—The following official announcements are given in regard to cases from the Bristol Channel :—

An application made to the Cardiff and District Engineers and Shipbuilders Employers' Association by the Ironfounders' Society, for a change of starting time from 6 a.m. to 7 a.m. for men employed at the Barry Graving Dock and Cardiff Dry Docks, was allowed by the arbitrator. An application made to the same Association relative to (1) rates of payment to platers' helpers engaged on oil-boats ; (2) the extra percentage payable to platers' helpers upon oil-carrying vessels to be paid upon the war wage advances given during the war was referred to the Committee on Production, whose award is (1) that the interpretation of Rule 12 of the 1911 Rules (agreed between the employers' association and the unions) should be applied ; (2) with regard to the claim for payment of oil-boat extras upon the war-wage advances, such extras shall be paid upon advances awarded and given by agreement up to April 1, 1917, but are not payable upon advances of 5s. and 3s. granted as from April 1 and August 1 respectively. An advance of 1s. per day as from August 1 was granted to men employed in discharging timber cargoes at Barry Docks.

THE FREIGHT MARKETS.

(FROM OUR OWN CORRESPONDENTS.)

London.—The freight market is without noticeable alteration. There has been very little chartering business done on the Baltic Exchange, but rates are nevertheless very firmly maintained. From the River Plate values are still nominally 145s. from the up river ports to United Kingdom, and 5s. less for down river loading. From the ports of the North American Atlantic seaboard the demand is pressing for tonnage on net form of charter, for which 200s. is quoted Northern Range to the United Kingdom, 250s. to the French Bay ports, and 325s. to West Italy. For Gulf loading an advance on these figures of 30s. would be conceded. The rate for heavy grain remains at 30s. and for oats at 25s. from the Range to the United Kingdom ; to France an extra 2s. 6d. would be conceded. Tonnage is required for carrying coals to the River Plate from Virginia and 125s. would be paid for this class of business, while to Rio de Janeiro 32 dols. is offered. The Eastern section of the market remains very strong. Karachi is worth 250s. on scale basis to the United Kingdom, and on deadweight Bombay offers 250s. to the United Kingdom and 400s. to the Mediterranean, while Calcutta could be done at 280s. to the United Kingdom. For kernels to Marseilles the Madras Coast offers 500s. The rice ports are seeking carrying space at 500s. Saigon to France, and the same figure Burmah to the United Kingdom. Sugar cargoes could be worked at 300s. Hong Kong to Port Said. In the Mediterranean section of the market chartering is being done from ore and phosphate ports on the basis of 45s. Huelva to the Mersey, 50 frs. Bilbao to Boulogne, 50s. Bougie to the Clyde, 65s. Tunis to the same destination, and 75s. Sfax to the East Coast, United Kingdom. For pyrites to the East Coast, United Kingdom, Huelva offers 60s. In the Bay trade Bordeaux to the Bristol Channel has been done at 21s.

Glasgow.—The Glasgow market continues quiet and inactive with very little of outstanding interest to report. The shortage of tonnage makes it very difficult to complete transactions. At the beginning of the present week the Exchange was closed owing to the autumn holidays, and since business was resumed, there has been few, if any, transactions reported. It is understood that the steamship lines will shortly issue a notice intimating an increase in all rates to the East and to Australia by about 33⅓ per cent. over the present tariffs, the advance to take effect from November 1, and provisionally, till the end of the present year. In the American trade one or two fixtures were reported, including the following :—Ship, Buenos Ayres to New York, about 55s., linseed ; steamer, Valentia to Seattle, 400s. per 50 c.f. bale basis ; and Virginia to Buenos Ayres, 70s., coal, September.

Newcastle-upon-Tyne.—Whilst coals are moving off briskly on official and inland account, and tonnage is plentifully supplied in respect of the former requisitions, very little private export business is possible by reason of the paucity of vessels on offer. The only charter arranged for destinations more distant than the French, Atlantic is that of an 1,800-ton vessel for Gothenburg at the firm rate of 200 kr. Coasting business is rather easier at 19s. to London at which price an 1,100-ton vessel has been taken up. For the rest, business has been wholly confined to North French ports at scheduled figures. The vigorous demand for cargo space for neutral destinations continues without abatement, so far as most directions are concerned. For Portugal, Lisbon continues quoted at 90s., and Oporto at fully 100s. Gibraltar is still listed at 97s. 6d. The Spanish Mediterranean is based on 210s. to Barcelona. Port Said is unaltered at 165s. There continues to be a good inquiry for Scandinavian destinations and Stockholm could be repeated at 207½ kr., were the tonnage available.

Liverpool.—Briefly stated, the demand for outward coal tonnage on this market is as keen as ever, but little business is possible, owing to the very limited number of boats offering. In these circumstances, rates are very firm, and especially so to uncontrolled destinations. Time chartering is also quiet, though there is no lack of inquiries. Suitable boats are scarce, but a fixture has been possible in the States-West Indies trade—a neutral 930 tons net register at 40s., one round trip. Homeward business is likewise on a small scale, and very high rates fail to attract tonnage. North America has a good inquiry for net charters, and 250s. has been paid on this basis for a 3,500-ton d.w. boat, New York to French Atlantic, September-October. To United Kingdom, 210s. is quoted, and to West Italy, 350s., in both cases for net charters. North America has also inquiries for grain tonnage at full recent rates. Eastern markets are quoting very high rates without any fixtures being possible. Indicated values are 400s. from Bombay to Italy, 250s. scale Karachi to United Kingdom, 550s. Madras Coast to Marseilles, and 500s. from rice ports to United Kingdom or France. Calcutta has paid 95$ per 50 cub. ft. for jute to Seattle, October. River Plate is reported to have fixed neutral boat to United Kingdom from Buenos Ayres at 200s.

Cardiff and Swansea.—Chartering has been on rather restricted lines, the tonnage position being a little less satisfactory. A strong inquiry was in evidence for Allied ports, but for other directions orders have not been so insistent. Rates on small sailing vessels for France have been further reduced. The following fixtures were reported for French ports :—Havre, 45s. 9d. (neutral) ; Brest, 45s. (neutral) ; St. Malo, 21s. (Allied) ; Caen, 46s. 6d. and 48s. (neutral) ; Trouville, Newport loading, 46s. 6d. (neutral) ; Honfleur, 48s. (neutral) ; Rouen, 48s. and 48s. 9d. (neutral). Two small sailing craft were fixed for Granville at 100s., and one for Cherbourg at 110s. At Swansea, the position remains unchanged. Rates have ruled strong for all destinations, and tonnage has been sparingly offered. The following business was reported :—Brest, 45s. (neutral) ; St. Malo, 43s. 6d. (neutral) ; Trouville, 48s. (neutral) ; Bilbao, 150s., fuel (neutral) ; Honfleur, Briton Ferry loading, 48s. (neutral) ; Honfleur, 46s. 6d. (neutral) and Havre, 22s. 6d. (Allied) for Port Talbot loading.

Hull.—The market has a firm tone all round, with a keen inquiry for North French destinations at limitation rates. A fair business is doing in this branch, especially in the chartering of small sailing vessels of 100 to 200 tons at 120s. or thereabouts for the North French group of ports. The West Italian market is quiet all round chiefly owing to lack of tonnage, as there is a fairly good inquiry. There is only a quiet trade passing in the neutral market, as operations are retarded there also by shortage of tonnage.

PORT NOTES.

Brest.—A Reuter message from Paris states that it is reported from Brest that the Council-General has voted a sum of 655,000 fr. for the construction of a concrete mole 250 metres long, capable of accommodating the largest vessels, like the *Vaterland*. The total cost will amount to 3,300,000 fr.

Milwaukee.—On the completion of the new 443-ft. reinforced concrete dock of the Chicago, Racine & Milwaukee Railway at Milwaukee, the docking facilities of the company will be quadrupled. The structure will be ready about October 1. The total expenditure has been $375,000, exclusive of the site, which is worth $200,000 alone.

Mobile and Memphis.—An expenditure of $503,470 is estimated for the municipal river terminal improvements, for which the city of Mobile recently voted $600,000 (bonds). The improvement will include a 7,500 ft. wharf, costing $232,500 ; 8,300 ft. of bulkhead, costing $33,206 ; six miles of railroad track, costing $72,000, &c. ; together with 2,000,000 cubic yards of dredging, to cost $120,000. River terminals will be constructed by the city of Memphis, which has voted $500,000 (bonds) to provide the necessary funds.

COMPANY REPORTS AND DIVIDENDS.

Hansa Lloyd Werke, Bremen.—The directors hope to declare the same dividend as was paid last year, viz., 12 per cent.

Cuxhavener Hochseefischerei A.G.—A dividend of 14 per cent. (15 per cent.) has been recommended for the financial year 1916-17.

King Line, Ltd.—An interim dividend of 6 per cent. per annum, less income-tax, has been declared on the Ordinary shares for the half year.

Flensburger Schiffsbau Gesellschaft.—The directors recommend a dividend of 10 per cent. for 1916-17. An equal dividend was paid last year.

Britain Steamship Company, Ltd.—The directors have paid an interim dividend of 10s. per share, free of income tax, viz., 5 per cent. actual, to shareholders on the register at September 13.

Stella Shipping Co., Ltd.—Edwards, Hepburn & Co., of Cardiff, managing owners of the company, announce an interim dividend of 1s. per share, free of income-tax, payable September 24, this being at the rate of 10 per cent. per annum.

Sunderland Steamship Co., Ltd.—The directors have declared an interim dividend of 2s. per share (20 per cent. per annum), free of income-tax, on the Ordinary shares for the past half-year, payable October 2. Last year the interim distribution was 3s. per share.

Prince Line, Ltd.—The report states that the net profit on the year's working (less provisions for depreciations, excess profits duty and income tax) amounts to £430,817, to which must be added the balance of £50,461 brought forward from last year, making £481,277 to the credit of profit and loss, which the directors recommend be dealt with as follows :—To Reserve Fund for protection of company's trades, £250,000 ; interim dividend of 5 per cent. paid March 3, 1917, £30,075 ; a further dividend of 25 per cent. (making 30 per cent. for the year), £150,374 ; carrying forward, £50,829.

Dundalk & Newry Steam Packet Co., Ltd.—The report of the directors for the half-year ended July 31 last states that the gross revenue amounts to £39,262, and the expenditure has been £35,775, showing a gain of £3,487. To this has to be added the amount brought forward from last half-year, £1,657, making in all £5,144. Out of this sum there has been transferred to reserve fund, £2,000, and a dividend of 3s. per share, less income-tax, is recommended, which will absorb £1,586, plus bonus of 1s. per share free of tax, £705, leaving to be carried forward £853. The reserve fund now stands at £43,207.

Flensburger Schiffsbau Gesellschaft.—A dividend of 10 per cent. (10 per cent. in the preceding year) has been declared for 1916-17. The accounts show :—General business account, £121,000 (£126,000), discount account £865 (£1,120), interest £140 (£4,610), depreciation £22,200 (£26,250), assurance £1,960 (£1,675), taxes £7,600 (£5,710), working expenses £42,500 (£48,250), repairs £10,000 (£9,730), sickness fund, &c. £3,360 (£3,760), pensions £244 (£239), priority interest £3,460 (£3,890), net profit £31,100 (£32,100). The balance sheet shows :—Stock, materials and vessels under construction £348,000 (£323,000), stocks £71,100 (£48,400), debtors £38,500 (£38,400), bank balance £63,900 (£61,300), cash £895 (£629), creditors £76,000 (£34,600), payments on account of vessels £279,000 (£266,000).

Thomas Heiton & Co., Ltd.—The report of the directors for the year ended July 31 last states that the profits (including dividends on investments, transfer fees, &c.), after payment of expenses of management and all other charges, and providing for bad and doubtful debts, amounted to £14,992, which with the balance brought forward makes a total of £22,109. Out of this the following payments have been made :—Interim dividend for the half-year to January 31, 1917, on the Preference shares at 5 per cent. per annum, £1,750 ; interim dividend for the half-year to January 31, 1917, on the Ordinary shares at 10 per cent. per annum, £3,000, leaving a balance of £17,359, which the directors recommend should be applied as follows :—Dividend for the half-year to July 31, on the Preference shares at 5 per cent. per annum ; final dividend for half-year to July 31, on the Ordinary shares at 10 per cent per annum ; write off premises, plant, &c., £2,588 ; Newbridge premises, £152 ; investments account, £1,000 ; and carry forward £8,869.

COMPANY REGISTRATIONS.

Gravesend Smelting & Refining Company, Ltd.—Capital £2,000 in 1,900 ordinary shares of £1 each, and 2,000 deferred shares of 1s. each. Objects, to carry on in the United Kingdom, the Colonies, India, and elsewhere the business of smelters and refiners of metals and mineral ores and products ; metallurgists, mechanical and electrical engineers, &c. Signatories :—

W. R. Hildridge, 95, New City Road, Plaistow, Accountant's clerk.
D. A. Harber, 2, Mackay Road, Clapham, S.W. (4), accountant's clerk.
W. R. Hildridge, 95, New City Road, Plaistow, accountant's clerk.
E. J. Gully, Hampden House, Phœnix Street, N.W., accountant's clerk.
W. W. Hodgson, 13, Gordon Street, W.C. (1), C.A.

The first directors are to be appointed by the subscribers. Registered office, 2, Gresham Buildings, Basinghall Street, E.C. 2. Private company.

"Paragon" Shipping Company, Ltd.—Capital, £20,000, in £1 shares. Objects, to acquire ss. *Paragon* and to carry on the business of ship owners, builders and repairers, &c. Signatories :—

W. Neale, 1, Curzon Road, Prenton, Cheshire, merchant.
W. Blair, Sidcot, Southdowns Road, Hale, Cheshire, merchant.

The first directors are to be appointed by the subscribers. Solicitor, R. M. Lott, 18, Water Street, Liverpool. Private company.

Kentish Shipbuilding & Engineering Company, Ltd.—Capital, £20,000, in £1 shares. Objects, shipbuilders, shipwrights, ship repairers, engineers, dredgers, tug owners, wharfingers, &c. Agreement with J. K. Morris. Signatories :—

J. K. Morris, 11, Drury Lane, Liverpool, shipowner.
R. Burbage-Clark, 17, Harp Lane, E.C. 3, consulting and marine engineer.

Minimum cash subscription, £2. The first directors are : J. K. Morris (chairman), not more than three others are to be appointed by the subscribers. Registered office, Lower Wall, Whitstable, Kent. Private company.

T. W. Smith & Co., Ltd.—Capital, £1,000, in £1 shares. Objects. to take over the business of Smyth & Co., ship and insurance brokers, carried on at 16, Eastcheap, E.C., also to carry on the business of shipowners, general merchants, carriers by land and sea, lightermen, &c. Signatories :

T. W. Smyth, 16, Eastcheap, E.C., shipowner.
R. E. Lindley, 16, Eastcheap, E.C., shipbroker.

The first directors are :—T. W. Smyth and R. E. Lindley. Registered office, 16, Eastcheap, E.C. Private company.

NEWS PARAGRAPHS.

London General Shipowners' Society.—At the annual meeting on Monday, the chairman (Mr. J. B. Wimble), in moving the adoption of the report for 1916-17, said that since the last annual meeting, shipping had become a controlled industry under the Ministry of Shipping, which had been appointed by the Government. A good deal had been said in public about shipowners' abnormal profits, but it must be realised that out of the present Blue Book rates there was scarcely a living to be made out of a ship. The question of the revision of these Blue Book rates had now received the attention of the Chamber of Shipping, and he hoped perhaps that in a short time they would receive some relief from the Minister of Shipping in that direction. There was one matter upon which he wished to express a hope, and that was that the Minister of Shipping would see whether at an early date he could devise some more systematic and satisfactory method of dealing with the claims of owners of vessels lost through war risks. He did not think it would be very hard to arrive at some satisfactory basis of dealing with these claims. Note should be taken of the cost of replacing vessels which were lost by war risks. It was out of all proportion to the money the owners were getting from the Government for the vessels so lost. He also wished to pay a tribute to the indomitable pluck of the men of the Mercantile Marine. Their conduct had been exemplary in every way in bravely facing the enemy submarines. Ships had had no difficulty in getting crews, and the thanks of the nation were due to the men for the work they had done during the war, and he hoped that when the time came they would be suitably recompensed. The report was adopted, and the meeting agreed to an alteration in the rules with a view to ensuring that only those with a real interest in the ownership of ships should be eligible as members of the Committee of the Society.

Mosa Sea-transport Insurance Company.—This company has been established in Rotterdam with a share capital of £416,666.

Londonderry Harbour Strike.—The strike of the Harbour Board employees at Londonderry has been settled; the men are to receive 4s. per week extra.

"Adriatica" Shipping Company, Venedig.—It has been decided to raise the share-capital of this company from £23,900 to £396,000 and, in addition, to issue a £396,000 loan.

Goods by Canal.—The Canal Control Committee are asking traders to send their goods by canal in order to relieve the railways and help in the solution of the traffic problem.

New Steamship Service.—A new steamship line has been established between Rio de Janeiro and Vladivostock. The first boat was to sail on September 8, carrying foodstuffs for Russia.

Porgrunds Cementstoperi.—This company is building the first concrete motor-lighter for coastal service (a vessel of 200 tons, with an 80-h.p. Bolinder motor) for the Bjaalands Laegterkompani, Skien.

Tonnage for Eggs.—A company which owns freezing plant at Hankow and Nanking is said to have the intention of placing orders in this country for the construction of two large steamers with refrigerated accommodation for the carriage of meat, poultry and eggs.

Trans-Pacific Steerage Rates.—In consequence of increased maintenance expenses, the steamship lines running from Victoria, Vancouver, Seattle and San Francisco to the Orient have advanced steerage rates by 10 per cent. It is stated that this class of accommodation has been largely patronised of late.

Shipbuilding in Tasmania.—The *Times* Sydney Correspondent says that steps are being taken to begin shipbuilding near Launceston, Tasmania. The Federal Government has directed the State shipbuilding yards at Williamstown to prepare a slip for a good-sized steamer, which will become part of the Commonwealth fleet of merchantmen.

Awards for Saving British Crew.—The Board of Trade have awarded pieces of plate to Don Juan Casasa y Rementol, master of the Spanish sailing vessel *Maria Asuncion*, of Bilbao, and Miguel Lopez Lloret, master of the Spanish trawler *Scomber*, of Barcelona, in recognition of their services to a shipwrecked British crew, whom they rescued last April.

River Murray Improvement.—At present the outlet of Australia's "Nile" does not permit of ocean-going vessels or of river craft going through the mouth and alongside big ships. A scheme is, however, under consideration with a view to the widening and deepening of the river, and the construction of a canal between Goolwa and Victor Harbour for river boats.

Wooden Shipbuilding at Seattle.—Another shipyard has commenced operations on war orders at Seattle. The keel of the first of ten 3,500-ton wooden ships to be built by the Patterson-MacDonald Shipbuilding Company has already been laid at their yard. The vessels will be 281 ft. long and 48 ft. beam. Work on the plant was started on July 8, and they expect to launch their first ship in December next.

Shipyards at Galveston.—Preparations are in progress at Galveston for a campaign to collect a fund of $100,000 to be used as a bonus to shipbuilders who establish plants there. The inducement to establish shipyards at Galveston is that a contractor will receive a bonus of $6,000 for each hull to cost not less than $300,000. The money will be forthcoming in the same manner and at the same time that payments are made by the Government.

Composite Ships.—According to the *Iron Age*, the Kelly-Atkinson Construction Company, Chicago, has contracted for the construction of 18 cargo-carrying steamers. These vessels are to be composite, or so-called McClelland ships, with all steel frames and wood plating. Each ship will require 800 tons of steel and 400,000 board feet of timber. They are to be 286 ft. long. 46 ft. beam, and 24 ft. draught.

Rewards for Sinking Enemy Submarines.—Monsieur John Jaffe, of Nice, has offered twelve rewards of £100 each, to the master, officers and crew of any British merchant vessel who can prove to the satisfaction of the Committee of Lloyd's that their vessel has destroyed an enemy submarine. Monsieur Jaffe offers this reward for the first twelve cases reported during the twelve months from September 10, 1917, to September 10, 1918.

Shipping Profits.—A remarkable instance of profit-earning by a cargo steamer is reported from Liverpool. Recently there arrived in that port a vessel with a cargo of 45,000 cases of onions from Valencia. The rate of freight paid on arrival, it is stated, was 16s. 6d. per case, which gives the extraordinary total of over £37,000 for the nine days' voyage from Valencia. The vessel is not British-owned, but sails under the flag of an Allied nation.

New Type of Norwegian Lifeboat.—A new type of lifeboat, designed by Herr L. T. Hansen, Inspector of Shipping, has been constructed in Norway for the use of ships passing through the submarine zone. It is 23 ft. long, 8 ft. beam, built of pine over oak and provided with a 4 h.p. motor. The boat is built-in fore and aft, the accommodation being right amidships, and will carry 21 persons. Its equipment is on the lines laid down by the Royal Decree.

Suspended Navigation Laws.—The Governments of Canada and the United States have announced the suspension of the coastal laws of both countries. This suspension provides that Canadian vessels may engage in the coastal trade of the United States, and the vessels of United States Registry may engage in Canadian coastal trade. The suspension of these navigation laws will make for convenience under present war conditions, though it will not greatly affect Canadian trade.

Japanese Shipping Regulations.—A Reuter message from Tokyo states that the Privy Council is considering the Cabinet's shipping control regulations, which prohibit the transfer charter or mortgage of vessels registered in Japan without license and forbids shipyards from accepting contracts from persons not registered in Japan unless the Government grants a permit. The regulations also place vessels, freights and routes under control of the Minister of Communications.

National Committee on Production.—Next month the National Committee on Production will hear applications for increases in wages under the agreement with the engineering and shipbuilding trades. The men, it is understood, will ask for an advance equal to the increased cost of living. As this stands at 80 per cent., the application is for one of the largest increases ever submitted by workmen. In these trades a 15s. a week war bonus has already been given.

Shipbuilding in Ontario.—The president of the Port Arthur Shipbuilding Company states that they have received orders for the building of ships to the value of £400,000, in addition to the large contracts already signed for. This will keep them working to augmented capacity until far into 1919, winter and summer. There are now 1,100 men working at the dry docks. Extensions are being arranged for every unit of the plant to cope with the great volume of business that is pouring in.

Marine Underwriters' Association.—The Office of H.M. Trade Commissioner in Canada has forwarded an extract from a recent issue of the *Montreal Gazette* to the effect that an association, known as the Canadian Board of Marine Underwriters, has been organised as a branch of the Montreal Board of Trade (Chamber of Commerce). The special aim of the association will be to secure beneficial interchange of views upon, and consideration of, matters pertaining to the general conduct of marine insurance.

Steel-making for Merchant Ships.—Preliminary work has commenced for transforming Hog Island, a large tract of land on the Delaware River below Fort Mifflin, into a site for a steel-making plant for merchant ships. An engineering squad is building a railroad loop, which is to connect with the Philadelphia, Baltimore and Washington Railroad. The plant will be built under supervision of the Emergency Fleet Corporation, by the International American Corporation, which is affiliated with the New York Shipbuilding Company.

Japanese War Insurance.—The revised Japanese war insurance rates are given as follows:—A low rate of premium for goods shipped to and from Japan; the new rate from London and Liverpool to be £2 6s. per cent., as against £2 2s. at present. The rate for the much shorter voyage to the Cape will be £3 14s. per cent., while for the voyage to Colombo and the Straits the new premium is to be £4 10s., and to China £4 12s. per cent., as against £2 2s. now quoted. Although owners of cargo to and from Japan in both Japanese and British bottoms may take advantage of the new scheme, cargo to British ports will only be insured under the scheme if shipped in Japanese vessels.

Proposed Tax on Vessels Clearing from Argentine Ports.—H.M. Minister at Buenos Aires telegraphs that the Argentine Budget Bill for 1918, which has recently been submitted to Congress, provides for the levy of a tax of 50 cents per register ton on sea-going vessels clearing from the ports of the Republic, and for the abolition of the free ports in Southern Argentina. Provision is also made, states the *Board of Trade Journal*, for certain increases of Customs dues, and for the establishment of Customs houses and the collection of dues in the Southern portion of the Republic.

Vancouver Needs Dry Dock.—In the Canadian House of Commons recently, the Hon. Robert Rogers, Minister of Public Works, stated that the shipping at the Port of Vancouver was increasing so rapidly that a dry dock there was necessary. He added that when in England he had impressed upon the Admiralty the desirability of constructing naval dry docks at Esquimalt and Halifax. Sir Edward Carson, then First Lord of the Admiralty, promised to take the matter into consideration, and Mr. Bonar Law had been favourably impressed by the proposal. The Admiralty would have first call on the dry docks when constructed, but repairs would be made to other ships.

Bunkering at Durban and Cape Town.—Durban during last year fully maintained its position as the leading bunkering port in South Africa, the tonnage trimmed into bunkers increasing from 930,687 tons in 1915 to 1,519,182 tons in 1916. This marked increase is more satisfactory in view of the fact that for the preceding three years the tonnage bunkered had remained practically stationary in the neighbourhood of a million tons. The diversion of shipping from the Suez route *via* the Cape of Good Hope was doubtless responsible for the increase. At Cape Town, the tonnage bunkered in 1916 also constituted a record, the total reaching 605,658 tons, as compared with 365,717 tons for the previous year.

Shipping Rates for Australasia.—Increased rates of freight are to come into operation immediately. In the Australian trade the usual freight for weight carrying has been £5 per ton and for measurement cargo £6 per ton. The rates have now been raised for both descriptions of cargo to £10 per ton. Similarly, in the New Zealand trade the usual rate now becomes £10 per ton, whereas hitherto the ordinary rate for weight cargo has been £4 15s. per ton, and for measurement cargo £6 per ton. The question of increased rates for both the outward and homeward voyages in the South African trade is still under consideration, but there seems reason to believe that a proposed advance of 33⅓ per cent. may be held to be hardly sufficient. Merchants in the Indian trade appear to be expecting an official announcement directly respecting the proposed advance in the Indian freights by 33⅓ per cent. as from November 1.

Patent Ship-Saving Device.—Captain F. Kolesar, of 4, Rossett Avenue, Sefton Park, Liverpool shipmaster, has patented a combined life-raft and wooden belt for damaged ships. The apparatus consists of flexible belts, each composed of a number of battens of wood arranged so as to fit into one another and be in touching contact. These belts are padded on one side, and can be easily unrolled and placed over the damaged part of a ship, either above or below the water-line, by means of keel ropes. When fixed in position it is claimed that they will prevent any serious influx of water, as the padded face of the belt makes a joint against the vessel's side all round the damaged part. When not in use the belt is rolled on a drum, which can be wheeled about the deck. The temporary repair thus effected will probably keep the ship from foundering before a port is reached. When necessary for life-saving, the apparatus may also be used as a raft.

Suez Canal Traffic.—The report of the British Suez Canal directors for 1916 shows a decrease in the net tonnage borne through the canal of 2,940,808 tons, as compared with 1915, and of 7,084,148 tons compared with 1914, and that the gross receipts were 80,882,403 fr., against 92,522,616 fr. in 1915 and 122,248,853 fr. in 1914. The number of vessels which passed through the canal was 4,802 in 1914, 3,708 in 1915 and 3,110 in 1916, of which 3,078 in 1914, 2,736 in 1915, and 2,388 in 1916 carried the British flag. There was a decrease of 1,867,848 tons last year, as compared with 1915, in the tonnage of British vessels, which amounted to 12,910,278 tons in 1914, 11,656,038 tons in 1915 and 9,788,190 tons in 1916. The tonnage of German vessels decreased from 3,352,287 tons in 1913 to 2,118,946 tons in 1914, and disappeared entirely in 1915 and 1916. The percentage of British vessels and their net tonnage in 1916 was 76·8 and 79·4 respectively. Of 1,885 merchant vessels and vessels in ballast of a net tonnage of 7,051,134 tons passing through the canal, 1,509 ships of a net tonnage of 5,762,788 tons were British, being 80·5 per cent. of the number and 81·72 per cent. of the tonnage. Holland, Japan, France, Russia, Norway, Sweden, Denmark, Italy, America, Belgium, Spain, Roumania and Greece combined contributed a total of 19·5 per cent. of the vessels and 18·28 per cent. of the tonnage of the carrying trade to the East through the Suez Canal.

Shipbuilding Profits in Denmark.—The Elsinore Iron Shipbuilding and Machinery Company has for the past financial year earned the substantial net profit of 2,490,000 kronen. Ordinary writings-off amounted to 340,000 kronen. For extraordinary taxes a sum of 500,000 kronen is set apart, and the shareholders obtain a dividend of 25 per cent. The remuneration to the Board having been provided for and 850,000 kronen added to the reserve fund, a sum of 12,630 kronen is carried forward. Last year's surplus was 1,257,000 kronen, the shareholders obtaining a dividend of 30 per cent., 110,000 kronen having been set apart for taxation and 50,000 kronen added to reserve.

Canadian Subsidies.—The total amount of mail subsidies and steamship subventions provided for by Canada during the fiscal year ended March 31 next is $2,630,734. In addition there are two payments, aggregating $321,666, for services between Canada and China and Japan, and between Canada and France. For a service from Canadian Atlantic ports to Australia and New Zealand, $140,000 is paid to the New Zealand Shipping Co.; the C.P.R. Ocean Services receive $1,000,000 for contract on the Canada-United Kingdom route; $340,666 is paid to the Royal Mail Steam Packet Co. for Canada-West Indies-South America sailings; and for a monthly steamer between Canada and South Africa, the Elder Dempster to receive $146,000.

New York Shipbuilding Corporation.—Mr. Marvin A. Neeland was elected President of the New York Shipbuilding Corporation on August 14 at a special meeting of the Board of Directors held in New York. The former president, Mr. S. M. Knox, resigned to assume the position of chairman of the Board in place of Mr. George J. Baldwin, who resigned, and was elected chairman of the Executive Committee. Mr. Knox, who held the position of president for many years, desired to be relieved of the more direct duties of the executive management of the Corporation. Mr. Neeland, the new President of the Corporation, was for many years Assistant Vice-President and Chief Engineer of the United States Steel Corporation, but for the last year has been consulting engineer of the American International Corporation, which is interested in and associated with the New York Shipbuilding Corporation. The Executive Committee was increased from three to five members, and now consists of Mr. George J. Baldwin (chairman), Mr. L. H. Shearman, Mr. P. A. S. Franklin, Mr. L. M. Knox and Mr. Marvin A. Neeland.

Japan's Shipping.—Returns issued by the Japanese Department of Communications give the number of shipowners owning vessels of over 1,000 tons and also their tonnage:—

Owners.	Number of vessels.	Tonnage.
N.Y.K.	99	458,703
O.S.K.	59	190,289
T.K.K.	10	89,811
Mitsui Company	11	35,083
Nisshin S.S. Co., of Kobe	12	29,663
Yamashita S.S. Co., of Kobe	10	24,161
Mr. S. Nakamura, of Kobe	9	19,915
Kishimoto S.S. Co., of Kobe	5	19,375
Tatsuma S.S. Co., of Kobe	7	19,388
Okazaki S.S. Co., of Kobe	7	18,380
Mr. G. Katsuta, of Kobe	5	17,221
Harada S.S. Co., of Osaka	5	16,210
Mitsubishi Company	6	16,004
Uchida S.S. Co., of Kobe	6	15,997
Mr. K. Yama, of Kobe	6	15,555
The Sugiya Company, of Kobe	5	15,205
Department of Agriculture and Commerce	5	14,286
Finance Department	6	12,221
Mr. K. Kawachi, of Osaka	4	11,610
Mr. F. Hiromi, of Osaka	5	11,602

The Nippon Yusen Kaisha, in view of the company's large extension of business, has decided to add new ports of call in the Australian and the Far Eastern lines. The new ports in Australia and New Zealand are Port Perry, Adelaide, Wallaroo, Newcastle, Fremantle, Wellington, Auckland and Lyttleton. In the Philippines, Iloilo and Cebu; in Java, Surabaya and Christmas.

"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and Type.	Tonnage.	Dimensions. Draught in ( ).	Sold by, to	Builders, hull and year.	Machinery and builders.	Remarks.
Campos Salles, ss.	901 gr. 490 net 800 d.w.	230′ × 35½′ × 11⅞′ (12′)	Amazon River Steam Nav. Co., London, to buyers not stated	Laird Bros., Birkenhead (1900)	15, 23, 38 × 24 (Laird Bros.)	Price about £37,500.
Cavanba, ss. (well dk.)	573 gr. 281 net 400 d.w.	172′ × 26′ × 12′ (13′)	D. MacDonald, Hong Kong, to buyers not stated	Bow, McLachlan & Co., Paisley (1901)	16, 27, 44 × 30 (Bow, McLachlan & Co.)	Price about £25,000.
Dana, ss. (well dk.) (ex *Clieveden*)	1,621 gr. 1,004 net	258′ × 36′ × 16½′ (18′ 6″)	O. Banck, Helsingborg, to H. Uner, Norrkoping	J. Blumer & Co., Sunderland (1883)	32, 60 × 39 (N.E. Mar. Eng. Co., Gateshead)	—
Grontoft, ss. (pt. awning dk.) (ex *Mistral*, ex *Liguria P.*, ex *Virginia Peirano*)	2,056 gr. 1,264 net 3,460 d.w.	275′ × 38′ × 18′ (19′ 8″)	Akties Skoglands Linje, Haugesund, to H. Cail & Co., Newcastle	J. Blumer & Co., Sunderland (1891)	21, 33, 54 × 42 (Alley & MacLellan, Glasgow)	—
Killeena, s.v. ..	812 gr. 750 net 1,250 d.w.	193¾′ × 31¾′ × 19¼′ (17′ 10″)	T. Dannevig & Co., Sandefjord, to buyers not stated	D. & W. Henderson & Co., Glasgow (1875)	—	Price about £27,500.
Kwanto Maru, ss. (spar dk.) (ex *Wakool*)	5,111 gr. 3,128 net 6,500 d.w.	400′ × 47½′ × 20¾′ (25′ 9″)	Goshi Kaisha Kishimoto Shokai, Japan, to French buyers	Sunderland S.B. Co., Sunderland (1898)	28, 47, 78 × 54 (N.E. Mar. Eng. Co., Newcastle)	Price about £425,000.
Racine, ss. (single dk.) (ex *Argo*)	1,089 gr. 740 net	173¾′ × 31½′ × 20¾′	Chicago, Racine & Milwaukee Line, Chicago, to United States Government	Craig S.B. Co., Toledo (1901)	15, 25, 42 × 24 (Craig S.B. Co.)	—
Shinkoku Maru, ss. (spar dk.) (ex *Wilcannia*)	5,145 gr. 3,100 net 6,200 d.w.	400′ × 47½′ × 20¾′ (25′ 10″)	Goshi Kaisha Kishimoto Shokwai, Dairen, to Messageries Maritimes, Paris	Sunderland S.B. Co., Sunderland (1899)	28, 47, 78 × 54 (N.E. Mar. Eng. Co., Newcastle)	Price about £410,000.
Solli, ss. (single dk.) (ex *Constance*, ex *Koln*) (re - named **Troldsund**)	685 gr. 384 net	172½′ × 27′ × 16¼′	Ellingsen & Johannesson, Bergen, to Mr. Victor E. Bull, Christiania	Bremer Vulkan, Vegesack (1899)	13⅜, 21 11/16, 34⅜ × 23⅝ (Bremer Vulkan)	—

East London (South Africa) Shipping.—There was an improvement in shipping at Buffalo Harbour, East London, in 1916; 386 steamers and 11 sailing vessels called during the year, an increase, compared with the previous year, of ten steamers and six sailing vessels, a total increase in numbers of 4·19 per cent. The gross and net tonnages were 1,706,283 and 1,027,367, a decrease of 198,285 and 61,974 tons respectively. Two hundred and eighty-two steamers and 11 sailing vessels, of a gross tonnage of 771,232, entered the river, one with a draught of 25 ft. 7 ins. Fifty-five other vessels had a draught of 20 ft. to 24 ft.

Flour for Ship Stores.—Under the Flour and Bread (Prices) Order, 1917, no person may take delivery of flour for ship stores for a ship departing on a voyage from the United Kingdom to parts beyond the sea except under licence, for which a charge of 18s. per 280 lb. will be made. The Food Controller has made arrangements for licences to be issued at the ports by the Customs authorities to masters or agents acting on behalf of masters on payment being made at the above rate. Ship stores dealers may act as agents for masters. Full information on the scheme is given in a leaflet obtainable on personal application at any Customs office.

The "Cumberland" and "Port Kembla" Losses.—The loss of the steamer *Port Kembla*, following that of the *Cumberland*, after a lapse of about three months, both from internal explosion, has caused a considerable amount of comment on the question of whether the loss does not attach to the War Insurance policies, rather than to the Marine policies, since there seems to be little doubt in the minds of those concerned that enemy action was responsible for the casualties. Indeed, cables from Australia indicate that there the view is generally held that the loss will fall on the War policy, though on this side precedent shows that in all probability the Marine underwriters will bear the loss. In the past three years we have seen not a few cases of a similar nature, though the vessels concerned were generally bound to or from the United States, and it is surprising that in view of the claims that have already been collected on these casualties that any question has arisen as to where the loss attaches, since the only difference in the circumstances is that the vessels were bound from a colonial port instead of from the then neutral country of America. It is as well, however, that the discussion has been brought to notice, since there is a very general feeling that despite precedent, the bearing of these losses by Marine underwriters is somewhat of a hardship, since this nature of peril was never contemplated when the rates were fixed for the Marine risk. So far as we know the collection of the losses has not yet been placed in the market, and perhaps some development on the lines of a compromise may come when the matter comes up for consideration. It would even seem that here is a unique opportunity for the Government to adjust its differences with the insurance market over the arbitration scheme, differences which are causing delay and inconvenience to owners and underwriters alike. It would be a fitting inception to the Arbitration Board should it commence its activities with the settlement of two cases offering difficulties of no small magnitude, but obviously cases needing treatment on the lines for which the arbitration scheme was primarily formed.

New Composition for Ships' Decks.—Mr. Peter Gavin, of Clydebank, who has for some time been experimenting in the production of a composition for use on ships' decks, saloons, corridors, and cabin floors, has now completed the invention of a new composition which he has patented and hopes shortly to place on the market. The chief feature of Mr. Gavin's material is its ability to withstand the effects of varying temperatures in different parts of the world, and he claims that as the result of severe tests his composition has the quality of expanding and contracting according to varying degrees of heat without the material losing its adhesion to the deck or floors on which it is laid, and without cracking, blistering, swelling or rising. It is also claimed that the composition when laid is an absolute preventative against water penetrating through it, and the manner of laying on the composition is also stated to be simpler—requiring neither elaborate preparation nor the services of specially skilled workmen.

Protecting Ships by Smoke Clouds.—The Bureau of Ordnance of the United States Navy Department is having manufactured by the Du Pont Company smoke boxes suitable for use by merchant vessels as a means of escape from attacking submarines. Merchant vessels desiring to procure these smoke boxes can obtain them from the Du Pont Company. The cost is approximately as follows:—Smoke funnel, $125 (£25) each; phosphorus, $1.75 per pound (8s. 9d.); smoke boxes, $25 (£5) each. The smoke funnel is for the production of smoke on board the vessel and requires only fuel for its continued use. The smoke boxes are for throwing overboard and once used cannot be recovered. The Navy Department is preparing to issue smoke boxes to all vessels carrying armed guards, and has announced as its policy that smoke-producing apparatus for the use of merchant vessels should be available for every vessel whose owner desires to purchase it. Owners of merchant vessels are urged to give prompt consideration to the desirability of purchasing smoke-producing apparatus. The Department of Commerce regard this as of great importance for protecting merchant vessels.

SHIPPING SHARE MARKET.

There has again been less business in the stock and share markets, despite the new reports from the Western front. As to number of bargains, the lead has been taken by Peninsular & Oriental deferred and Khedivial Mail shares, two descriptions of shipping security which may be described as representative of heavy and light weight bargains. Nine transactions were marked in Peninsular & Oriental deferred last Thursday at prices ranging from 318½ to 321, the official quotation going out at 317–322, so that it may be assumed that buyers and sellers were about evenly balanced. Khedivial Mails changed hands freely on the same day at between 30s. and 31s. 6d. The financial year ended at June last, but as the accounts have to be collected from overseas it is usually late in the year before the final dividend is declared. Among shares not quoted officially Prince Lines have hardened on the issue of the report, to which we refer elsewhere in this number, and the declaration of the final dividend of 25 per cent., making 30 per cent. for the year, the same as for the previous period. King Line ordinary have also been dealt in at 37s., as against 35s. 9d., on the declaration of an interim dividend of 6 per cent. per annum, the same as for the previous year. Sutherland Steamship shares are a quiet market, no transactions having been recorded between August 9 last (when they were marked at 52s. 6d.) and the day of the declaration of the interim dividend this week of 20 per cent., although the latter is 10 per cent. less than the amount of the interim dividend last year. This brings the dividend back to the basis of 1914–1915. The shares are freely dealt in at Newcastle, and appear to maintain their price since the last London "marking." In the miscellaneous markets, such as shipbuilding, iron, coal and steel shares, there has been again considerable activity on reports of the enhanced profits being made by these undertakings, but the best buying appears to be on an investment basis with a view to after-the-war activity.

SHIPPING, SHIPBUILDING, ENGINEERING AND MARINE INSURANCE SHARE LIST.

SHIPPING.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
African S.S.	20	33—23½	10	6⅔	29	
Allan Line ... ... Deb.	100	—	4	4⅓	92	
Anchor Line ... Cum. pref.	10	9⅞—9¼	5½	5⅞	9¼	
Do. ... ... Deb.	Stk.	105⅜—102⅜	4⅜	4⅜	103	
Argentine Nav. ... Cum. pref.	1	19/6—11/-	Nil.	Nil.	23/3	−1/3
Do. ... ... Ord.	1	14/6—5/6	Nil.	Nil.	18/3	
Australasian Un. S. Nav. Deb.	Stk.	83⅜—80⅛	4	5	79	+1
Belfast Steam ... ... "A"	10 (5pd.)	—	5	5	5	
British & African Nav. Deb.	Stk.	96½—91	4½	4⅜	102	
British India Nav. ... Deb.	Stk.	94¼—88¼	4½	5⅓	83	
British S.S. Invest. Trust Def.	Stk.	357—190	30*	8⅜	350	
Do. ... ... Pref.	Stk.	108—105⅜	6	5⅞	103	+2
Do. ... ... Deb.	Stk.	79—77⅛	4⅜	6⅛	74	
Cairn Line ... ... Deb.	Bds.	99—88	5	5½	90½–91	
Do. ... ... Ord.	1	—	20†	9⅞	42/-	
Clan Line ... ... Ord.	10	32½—22½	25	8⅓	30	+1
Court Line ... ... Ord.	£1	42/—26/-	20	13⅓	30/6	+ -/6
Cunard SS. ... ... Ord.	1	101/—68/-	20*	5⅞	75/-	+3/-
Do. ... Cum. pref.	Stk.	95—89	5	5⅞	85½	
Do. ... ... Deb.	Stk.	99⅜—93¾	4⅜	4⅝	96	
Elder Line ... ... Deb.	Stk.	97¼—89⅜	4⅜	4⅜	103	
Elder Dempster ... Cum. pref.	1	20/6—18/1⅜	5⅜	5½	18/6	
Do. ... ... Deb.	Stk.	92⅜—88⅜	5	5⅝	86	+3
Ellerman Lines ... Pref. Ord.	10	9¹³/₁₆—9¼	6¾	6⅝	8¾	
Do. ... Guar. pref.	10	9¹⁵/₁₆—8¾	4⅜	5¼	8¾	
France Fenwick ... Cum. pref.	5	98/5—92/6	5⅜	6⅛	87/6	−2/6
Furness, Withy ... Ord.	1	61/3—34/3	20*	9⅜	47/3	
Do. ... Cum. pref.	10	9¼—7⅜	5	5⅝	9	+ ¼
General Steam Nav. Ord.	7⅜	12⅞—8⅞	15	7⅛	22/6	
Do. ... ... Pref.	8	7⅞—6⅜	6	7⅛	16/-	
Houlder Line ... Cum. pref.	5	83/9—67/6	5⅜	6⅜	80/-	+2/6
Do. ... ... Deb.	Stk.	—	4⅜	4⅝	93	
Houlder Bros. ... Cum. pref.	5	—	5⅜	5⅜	4	
Do. ... ... Deb.	Stk.	—	4⅜	5⅜	82	
India Gen. Nav. & Rly. ... Ord.	10	12—8⅜	6	5⅞	10⅜	+ ⅛
Indo-China N. ... Pref. Ord.	5	5⅞—90/-	6	6⅔	90/-	
Irrawaddy Flotilla	40	—	15	5⅞	116	
Khedivial Mail ... ... Ord.	1	37/—10/-	25	13¾	30/6	
Do. ... ... Pref.	5	77/6—60/6	5⅜	7⅛	75/-	
Do. ... ... Deb.	Stk.	94⅜—87¼	4⅜	4⅝	95	
King Line ... ... Ord.	1	—	16*	9⅜	37/-	
Lamport & Holt ... Cum. pref.	£1	20/9—18/9	6	6	19/6	
Leyland (F.) ... Cum. pref.	10	8⅜—6½	5	6⅜	7½	
Mercantile SS. ... ... Ord.	5	18⅜—12	40	13	15	
Do. ... ... Pref.	1	20/1⅜—20/-	5	6¼	15/-	−1/3
Moor Line ... ... Ord.	10	—	30	13¼	22½	−2
Nelson Steam Nav. ... Deb.	100	98¾—97⅜	5	5⅛	98⅜	
New Zealand ... ... Ord.	£10	—	8	2½	32½	
Do. ... ... Deb.	Stk.	90⅜—88	4	4⅝	86	
Nitrate Producers SS. ... Ord.	5	25¾—18	30	6½	24½	
Do. ... Cum. pref.	5	—	5	5	5	
Oceanic Steam. Nav. ... Deb.	100	99—95⅛	4⅛	4⅜	96	
Orient.Stm.Nav.Co. Cum. pref.	10	9⅜—9¹³/₁₆	5	5⅛	9	
Do. ... ... Deb.	100	98—91⅜	4½	5⅛	89	
P. & O. S. N. ... Cum. pref.	100	100—91	5	5⅜	92	
Do. ... ... Def.	100	349—270	18	5⅝	321	
Do. ... ... Deb.	Stk.	71—69	3½	5⅜	63	
Prince Line	1	95/—26/-	30	7¾	85/-	+2/6
R.M.S.P. ... ... Ord.	100	134⅛—97½	7	6⅛	113	+1
Do. ... ... Pref.	Stk.	86¾—76⅜	5	6¼	81	
Do. ... ... Deb.	Stk.	89—86	4⅛	5⅛	79	
Shaw, Savill & Alb. Cum. pref.	5	95/—86/3	5¼	5⅝	85/-	
Shell Transport ... ... Ord.	1	6—4⅛	35	5⅜	5⅛	
Do. ... Cum. pref.	10	10⅛—9	5	5¾	9⅞	
Sutherland SS. Co.	£1	69/6—41/6	30	10	52/-	
Union-Castle SS. Cum. pref.	10	7¹¹/₁₆—7	4⅜	5	7⅛	
Do. ... ... Deb.	Stk.	92⅞—86¾	4	4⅝	87⅛	
West Hartlepool ... ... Pref.	10	8¼—7⅜	5⅜	7⅜	7⅜	

INSURANCE.

Alliance	20 (2·4 pd.)	10½—8⅜	12/-	7	9¹³/₁₆
Indem. Mutual Marine	15 (3 pd.)	13⅜—9⅛	15/-	5	20⅜
London Assurance	25 (12½ pd.)	52⅜—42½	20	6	56xd
Marine Insurance	25 (15 pd.)	36½—33⅜	45/-	6	56
Merchants' Marine Insurance ...	10 (2½ pd.)	7⅛—71/3	10	6	9¾
N. British & Mercantile Ord.	25 (6¼ pd.)	34⅜—29	40/-	6⅜	34⅛
Phœnix Assurance	10 (1 pd.)	7⅜—5⅜	40	7	7⅜
Reliance Marine	10 (2 pd.)	—	20	4⅛	7½
Royal Exchange Assurance ...	Stk.	189½—181	10	5½	225
Sea Insurance	10 (2 pd.)	19½—19⅛	10	6	27⁹/₁₆
World Marine, Limited ...	5 (2 pd.)	61/3—35/-	5	4½	6¼

IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
Babcock & Wilcox... ... Ord.	1	64/6-47/10⅛	15	5	65/-	
Baldwins ... Cum. pref.	1	1⅛—1	5⅛	5⅛	20/-	
Do. ... ... Deb.	Stk.	87⅛—86¼	4⅛	5⅛	84	
Bayliss, Jones ... Cum. pref.	1	—	5	7¼	⅛	
Bell Bros. ... ... Cum. pref.	10	10³/₁₆—9³/₁₆	6	6¼	9¼	
Do. ... ... Deb.	Stk.	80—75⅛	5	6⅝	75⅛	
Bessemer (Henry) ... Ord.	1	29/—26/-	12⅛	8⅛	29/9	+4/6
Bolckow Vaughan ... Ord.	1	25/10⅛-18/-	11	8	27/-xd	+ -/9
Do. ... ... Cum. pref.	20	19—18	5	5⅞	16	
Cargo Fleet Iron ... ... Ord.	1	23/3-13/10⅛	3	3⅛	23/-	
Do. ... ... Deb.	100	86¼—84	4⅛	5⅛	82	
Consett Iron Co. ... ... Ord.	1	89/4⅜—65/3	50	11⅜	90/-	+2/6
Dominion Iron & Steel	Bds.	83—78	5	6⅜	78	--1⅜
Dorman, Long ... ... Ord.	1	36/—22/3	14	9	40/-	
Do. ... ... Deb.	Stk.	97⅛—97	4	5⅛	73	
Ebbw Vale Steel & Iron Ord.	1	28/7⅛—19/-	12⅛	9¼	28/6	— -/6
Guest, Keen & Nttefids Ord.	1	71/3—60/-	15*	3¾	76/-	—1/6
Do. ... ... Cum. pref.	5	5¼—5⅛	5	4¾	5⅛ xd	
Do. ... ... Deb.	Stk.	82⅜—80½	4	5¼	79¼	
Hadfield's Steel Foundry Ord.	1	82/6—69/-	30	6	100/-	+1/-
Ibbotson Bros.	5 (4 pd.)	8—6	7⅛	4⅜	6¾	
Jessop (W.) & Sons ... Ord.	5 (4 pd.)	9—8	15*	7⅛	9	+ ⅜
Lanarkshire Steel Cum. pref.	10	—	5	7⅛	7	
Lysaght (J.) ... Cum. pref.	1	22/7⅛—20/3	6	6	20/-	
Do. ... ... 2nd pref.	1	21/1⅜—21/-	6	6	20/-	
Manganese Bronze ... Ord.	1	—	6	11	1¼	
Do. ... ... Cum. pref.	1	—	6	8	¾	
North-Eastern Steel ... Deb.	Stk.	—	4⅛	—	—	
Palmers Ship & Iron "A" ...	1	12/6—9/-	Nil.	Nil.	10/9	+1/-
Scott (Walter) ... ... Ord.	1	26/3—17/9	15	12	25/-	−2/6
Do. ... ... Pref.	1	16/10⅛—16/3	6	7⅜	16/3	
Sheffield Forge ... ... Ord.	1	—	15	7½	69/-	+10/-
Shelton Iron & Steel ... Ord.	1	20/4½—15/-	7⅛	8⅜	21/-	
Do ... ... Deb.	100	94—92⅛	5	5¼	91½	
S. Durham Steel & Iron Ord.	1	37/6—27/-	10	6⅜	36/-	— -/6
Do. ... ... Cum. pref.	1	21/—19/-	6	6¼	20/-	
Do. ... ... Deb.	Stk.	82—80	4⅛	5⅛	80	
Steel Co. of Scotland ... Ord.	10	—	10	10	12/1/-	
Stewarts & Lloyds Pref. ord.	10	18⅜—17	10	6⅞	16	+ ⅛
Do. ... ... Cum. pref.	10	—	6	4⅜	13⅛	
Stone (J.) ... ... Cum. pref.	10	—	5	6¼	8	
United States Steel ... Ord.	100$	144⅜—83⅛	8	6⅛	116xd†	— ¼
Do. ... ... Cum. pref.	100$	128⅜—112⅜	7	5⅞	122½xd‡	—1⅛
Vickers Ltd. ... ... Ord.	1	40/3—33/6	12⅛	6⅛	39/6	+1/-
Do. ... ... Pref.	Stk.	93—85	5	6	84	
Do. ... ... Deb.	Stk.	83—75	4	5³/₁₀	78	
Weardale Steel ... Def. ord.	1	34/—19/1⅛	19½	13⅜	29/-	
Do. ... ... Cum. pref.	1	23/6—17/6	6	5	24/6	— -/6
Do. ... ... Deb.	Stk.	70⅛—69¼	4	6	63	
Workington Iron & Steel Ord.	1	24/3—14/3	10	7⅜	26/-xd	

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth Ord.	1	43/—34/6	12½	7	40/6	
Do. ... ... Cum. pref.	5	75/—67/6	4	5⅔	70/-	
Do. ... ... Deb.	Stk.	80¼—75	5	6⅔	76	+ ½
Beardmore (W.) ... ... Deb.	100	99—92	4⅜	5	91	
Brown (John) ... ... Ord.	1 (15s. pd.)	27/3—20/6	12⅛	8⅛	26/6	+ -/4½
Do. ... ... Cum. pref.	10	10—5⅜	5	5¼	8¾	▸ ⅜
Cammell Laird ... ... Ord.	5	7—98/-	10	8	7⅛	▸ ⅛
Do. ... ... Cum. pref.	5	88/—76/3	5	6⅔	85/-	
Do. ... ... Deb.	100	93½—85	4⅛	5⅜	81	
Dunlop (Jas.) ... ... Ord.	1	19/7⅛-13/4⅛	10	10⅛	19/-	
Do. ... ... Cum. pref.	1	17/1⅛-16/4⅛	6	7⅛	17/6	
Fairfield Shipbldg Cum. pref.	10	8⅛—8¹/₁₆	6	7⅛	8⅛	
Fleming & Ferguson ... Ord.	10	—	10	7	14½	
Gray (Wm.) ... ... Deb.	100	100½—99½	4⅛	4⅛	100½	
Hawthorn (R. & W.) Leslie Ord.	10	15⅜—14	12⅛	5⅜	23	+8
Henderson (D. & W.) Cum. pref.	1	—	5	8⅛	⅛	
Richardsons Westgarth Ord.	1	7/9—2/10⅛	Nil.	Nil.	6/6	
Do. ... ... Cum. pref	1	15/7⅛—8/-	Nil.	Nil.	16/9	+ -/3
Do. ... ... Deb.	Stk.	69—67½	4⅛	6⅛	65	+2
Simons (W.) ... Cum. pref.	10	—	5	5	9¹⁵/₁₆	
Swan, Hunter & W. R. ... Ord.	1	35/6—26/-	12⅛	6½	41/6	
Do. ... ... Cum. pref.	1	18/9—17/-	5	5⅛	17/-	
Do. ... ... Deb.	Stk.	82—80⅛	4½	5⅜	78	
Thornycroft (John I.) ... Ord.	1	38/9—21/9	17⅛	9½	37/1⅛	
Do. ... ... Cum. pref	1	18/6—16/3	6	6⅜	18/-	
Do. ... ... Deb.	100	95⅛—88	5	5⅛	84	
Wallsend Slipway ... Ord.	1	2—1⅛	10	5	2	
Do. ... ... Cum. pref.	1	1—1	5	5	1	

* Including bonus. † Also 20 % in shares. ‡ Treasury price.

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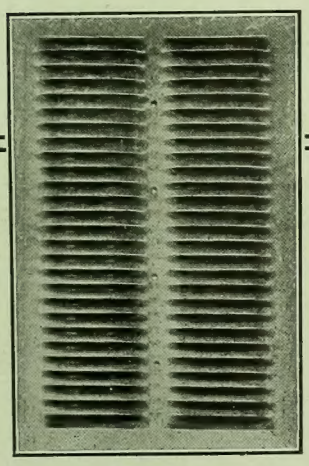

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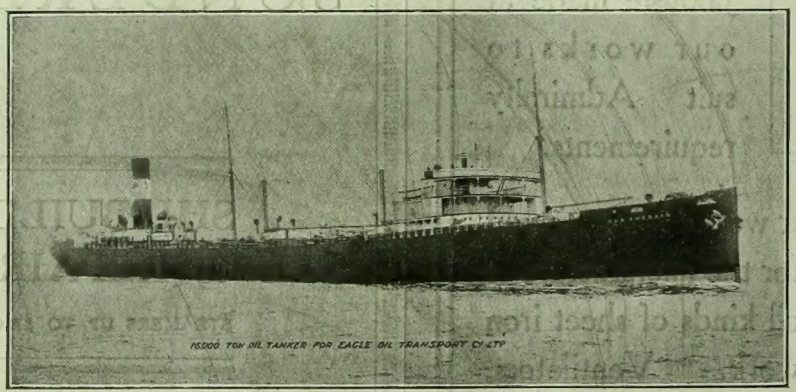

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SUNDERLAND

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